

CITY GOVERNMENT.

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\$3 A YEAR.

MUNICIPAL REVENUES AND EXPENSES.

Probably the most comprehensive and valuable data ever gathered on the subject of municipal revenue is that recently collected and compiled by Mr. August Herrmann, commissioner of waterworks of Cincinnati. Mr. Herrmann's report will be found of great interest to all city officials, as the facts presented therein bear directly upon the affairs of all municipal departments, and it is therefore published in complete form, excepting introductory remarks, for the first time in this number of CITY GOVERNMENT.

Exhibit A of Mr. Herrmann's report, presented as a supplement to this paper, is a tabulated statement of replies received to a series of questions sent out to all the larger cities. This table is well worthy of careful study, as it reveals many interesting facts pertaining to municipal finance. The report says:

The first table that I will present is the total tax rate for these various cities in the year 1898, this including the State, county, municipal, educational, sinking fund and interest, and other special levies which go to make up the grand total, as follows:

Cities.	Rate per \$1,000	Cities.	Rate per \$1,000.
Chicago, Ill.....	\$96.50	Pittsburg, Pa.....	\$23.65
Omaha, Neb.....	47.12	Buffalo, N. Y.....	23.54
Toledo, Ohio.....	33.20	Milwaukee, Wis.....	23.12
Denver, Col.....	31.00	*St. Paul, Minn.....	21.40
Cleveland, Ohio.....	29.30	Newark, N. J.....	21.00
Jersey City, N. J.....	28.90	Rochester, N. Y.....	20.73
New Orleans, La.....	27.00	St. Louis, Mo., max.....	20.50
*Columbus, Ohio.....	27.00	St. Louis, Mo., min.....	16.70
Kansas City, Mo.....	26.24	Albany, N. Y.....	20.00
Cincinnati, Ohio.....	26.18	Detroit, Mich.....	19.23
Minneapolis, Minn.....	25.00	Philadelphia, Pa.....	18.50
Allegheny, Pa.....	24.95	Indianapolis, Ind.....	17.30
Nashville, Tenn.....	24.50	San Francisco, Cal.....	16.95
Baltimore, Md.....	24.37	*Providence, R. I.....	16.50
Louisville, Ky.....	23.05	Boston, Mass.....	13.50

*Does not include street cleaning.

*Does not include removal of ashes.

*Does not include removal of ashes and garbage.

At the first glance at these figures one can hardly believe that there could be such a wide diversity in the rates of taxation in the larger cities of the country as the above would indicate; but the truth of the matter is that when analyzed there is no such divergence. In the first place, in making comparisons, the answers submitted to the question "At what per cent of its true value is real estate returned for taxable purposes in these cities?" must be taken into consideration. This is the key to the entire situation. While the figures above apparently show that the tax rate of the city of Chicago is the highest in the country, being four and even five times greater than some of the cities above shown, the fact is that in reality they have one of the lowest tax rates in the country. This is explained by the fact that in Chicago real estate is returned at 11 per cent. of its true value, while in the other cities referred to it runs up from 35 per cent. in the city of Cleveland, Ohio, to 100 per cent. in the cities of Boston, Pittsburg, Allegheny, Newark, Minneapolis, Jersey City and Providence.

As an illustration on this line: The tax rate in Chicago is \$96.50 per \$1,000, but real estate is returned at 11 per cent. of its true value; while in Providence the rate is \$16.50 per \$1,000, and real estate is returned at 100 per cent. of its true value. Thus, if a person had a piece of real estate in Chicago the true value of which was \$10,-

000, it would be returned for taxation at 11 per cent. of its value, viz., \$1,100, and assessed at the rate of \$96.50 per \$1,000, which would make the taxes for this property \$106.15 per annum; while in the city of Providence, with a tax rate of \$16.50 per \$1,000, as against \$96.50 in Chicago, this same property, the true value of which was \$10,000, would be returned for taxation at 100 per cent. of its value—viz., \$10,000—and assessed at the rate of \$16.50 per \$1,000, which would make the taxes for this property in that city \$165 per annum, or \$58.85 per annum more than in Chicago, with its \$96.50 rate.

In order, therefore, that this matter may be considered intelligently, I have prepared three tables, which I present for your consideration, as follows:

(a) The tax rates of these cities on a uniform valuation, representing real estate on a basis of 75 per cent. of its true value, leaving the personal property remain as returned.

(b) The tax rate of these cities on a uniform valuation, representing real estate on a basis of 75 per cent. of its true value, exclusive of moneys required for State and county purposes.

(c) The tax rates of these cities on a uniform valuation, representing real estate on a basis of 75 per cent. of its true value, exclusive of moneys required for State and county purposes, and interest and sinking fund purposes, this table showing rate on a uniform basis for municipal purposes only.

Table "A" is produced by taking the present valuations

Name of City.	Present Taxable Valuation.	Total Tax Rate per \$1,000.	Percentage of true value of Real Estate.	Amount produced.	Valuation on a uniform basis of 75 per cent. of the true value of Real Estate.	Rate needed to produce same amount of money.
*St. Paul, Minn.....	\$93,000,000	\$21.40	40	\$1,000,200	\$161,682,500	\$12.31
Kansas City, Mo.....	67,750,000	26.24	40	1,777,760	113,250,000	15.70
Cleveland, Ohio.....	141,915,430	29.30	35	4,158,122	263,919,535	15.76
*St. Louis, Mo.....	353,988,510	16.70	60 to 66%	6,584,186	409,821,885	16.07
Indianapolis, Ind.....	121,000,470	17.30	70	2,093,308	126,810,098	16.51
San Francisco, Cal.....	351,784,094	16.95	75	5,962,740	351,784,094	16.95
Boston, Mass.....	1,036,063,094	13.60	100	14,090,458	838,114,369	17.01
Chicago, Ill.....	232,026,610	96.50	11	22,300,567	1,906,354,420	17.14
Detroit, Mich.....	207,636,860	19.23	65 to 70	3,992,856	864,516,333	17.63
Philadelphia, Pa.....	864,516,035	18.50	75	15,993,516	864,516,333	18.50
*Columbus, Ohio.....	62,685,080	27.00	50	1,692,497	89,515,745	19.34
Newark, N. J.....	138,373,305	21.00	70	2,995,839	146,371,179	19.37
Milwaukee, Wis.....	144,683,425	23.12	65	3,345,080	193,322,824	20.48
*Providence, R. I.....	181,558,120	16.50	100	2,995,799	146,371,179	20.54
Denver, Col.....	73,101,485	31.00	50	2,266,146	109,652,227	20.67
Cincinnati, Ohio.....	196,671,104	26.18	58	5,140,096	244,006,522	21.07
Buffalo, N. Y.....	112,792,990	20.73	80	2,338,180	106,024,111	21.92
Rochester, N. Y.....	245,674,630	23.54	70	5,783,180	262,133,505	22.06
Omaha, Neb.....	33,049,303	47.12	33%	1,557,457	67,330,582	23.13
Albany, N. Y.....	68,276,895	20.00	95	1,395,537	57,382,120	23.65
Louisville, Ky.....	118,800,000	23.05	70	2,809,620	118,800,000	23.65
Toledo, Ohio.....	50,500,000	33.20	50	1,676,600	60,500,000	24.12
Baltimore, Md.....	362,122,738	24.37	75	8,826,741	362,122,738	24.37
Nashville, Tenn.....	35,399,390	24.50	75	867,245	35,399,390	24.50
New Orleans, La.....	139,199,913	27.00	60	3,758,397	122,427,328	28.77
Pittsburg, Pa.....	267,764,072	23.65	100	6,332,620	201,208,625	31.46
Minneapolis, Minn.....	109,654,337	25.00	100	2,741,358	86,705,851	31.62
Allegheny, Pa.....	75,500,000	24.95	100	1,883,725	56,652,000	33.47
Jersey City, N. J.....	89,062,761	28.90	100	2,599,933	69,335,956	37.49

*St. Louis maximum rate \$30.50; minimum rate, \$16.70.

*Does not include removal of ashes and garbage.

*Does not include cleaning of streets.

and the tax rate as fixed and ascertaining first the amount of money to be produced on such a valuation at the rate as fixed; then the valuation is increased or decreased as the case may be, so that real estate, instead of being returned at the various values now in vogue, is assessed on a uniform basis of 75 per cent. of its true value, and the rate ascertained to produce the same amount of money on the revised valuation.

From this table it will be seen that for all purposes combined, and on assessable valuation arranged on a uniform basis, St. Paul, Minn., has the lowest tax rate of all the cities enumerated, viz., \$12.31 per \$1,000, while Jersey City has the highest rate, viz., \$37.49.

Table "B" is produced by taking the present assessable valuation and the tax rate as fixed for State and county purposes, and ascertaining first the amount of money to be produced on such an assessable valuation for such purpose at the rates as fixed, and then taking the assessable valuation on a uniform basis of appraising real estate at 75 per cent. of its true value, and determining the rate required on such a valuation to produce the same amount of money, and then deducting that rate from the total rate as shown in Table "A," thereby giving the total rate for all purposes, exclusive of State and county purposes, on a uniform basis of valuation. The result of this is as follows:

TABLE B.

Name of City.	Amount of money to be produced for State and County purposes.	Rate required per \$1,000 to produce same money. Basis of calculation valuation on a uniform basis of assessing real estate at 75 per cent. of its true value.	Total tax rate exclusive of State and County purposes, for \$1,000 on a uniform valuation
¹ St. Paul, Minn.....	\$399,900	\$2.47	\$9.84
Indianapolis, Ind.....	746,210	5.89	10.62
Omaha, Neb.....	764,269	11.35	11.78
² San Francisco, Cal....	1,794,099	5.10	11.85
Cleveland, Ohio.....	1,007,600	3.82	11.94
Kansas City, Mo.....	422,760	3.73	11.97
Denver, Col.....	884,528	8.07	12.60
³ Columbus, Ohio.....	544,733	6.22	13.12
Newark, N. J.....	899,426	6.15	13.72
St. Louis, Mo.....	884,971	2.16	13.91
Chicago, Ill.....	3,341,183	2.56	14.58
Detroit, Mich.....	672,743	2.97	14.66
Nashville, Tenn.....	336,294	9.50	15.00
Boston, Mass.....	1,657,701	2.00	15.01
Milwaukee, Wis.....	870,994	5.33	15.15
Cincinnati, Ohio.....	1,268,557	5.20	15.90
Rochester, N. Y.....	545,015	5.12	16.85
Buffalo, N. Y.....	1,169,411	4.46	17.60
Toledo, Ohio.....	439,350	6.32	17.80
⁴ Providence, R. I.....	326,805	2.24	18.30
Louisville, Ky.....	623,700	5.25	18.40
Philadelphia, Pa.....	No separate rate.		18.50
Albany, N. Y.....	277,886	4.75	18.60
Baltimore, Md.....	678,980	1.37	22.50
New Orleans, La.....	974,399	7.98	22.79
Minneapolis, Minn.....	734,684	8.47	23.15
Pittsburg, Pa.....	1,606,584	7.98	23.48
Allegheny, Pa.....	453,000	8.00	25.27
Jersey City, N. J.....	768,282	11.08	26.41

¹Does not include removal of ashes.

²Includes county.

³Does not include street cleaning.

⁴Does not include removal of ashes and garbage.

From this table it will be seen that for all purposes combined, exclusive of State and county levies, based on a valuation arranged on a uniform basis, St. Paul, Minn., has the lowest tax rate of all the cities enumerated, viz., \$9.84 per \$1,000, while Jersey City has the highest rate, viz., \$26.41.

Table "C" is produced by taking the present assessable valuation and the tax rate as fixed for sinking fund and interest purposes, and ascertaining first the amount of money to be produced on such a valuation for such purpose at the rates as fixed, and then taking the valuation on a uniform basis of assessing real estate at 75 per cent. of its true value, and determining the rate required on such a valuation to produce the same amount of money, and then deducting that rate from the total rate as shown

in Table "B," thereby giving the total rate for municipal purposes only on a uniform basis of valuation. This rate is the one over which municipal officers have control, and, as shown, does not include taxes for State, county, and sinking fund and interest purposes. The result of this is as follows:

TABLE C.

Name of City.	Amount of money produced in 1898 for bonded indebtedness, including interest.	Rate necessary to produce same on a uniform basis of assessing real estate at 75 per cent. of its true value.	Actual tax rate for all municipal purposes, including education, on a 75 per cent. basis. This is exclusive of State, County and Sinking Fund and Interest purposes.
Indianapolis, Ind.....	\$508,201	\$4.00	\$6.62
Nashville, Tenn.....	230,096	6.50	28.50
¹ St. Paul, Minn.....	307,365	1.28	8.56
² Columbus, Ohio.....	297,127	3.39	9.73
Boston, Mass.....	4,268,579	5.14	9.87
Omaha, Neb.....	109,063	1.62	10.16
Cleveland, Ohio.....	411,554	1.55	10.39
St. Louis, Mo.....	1,415,954	3.45	10.46
Denver, Col.....	219,304	2.00	10.60
Kansas City, Mo.....	135,500	1.18	10.79
³ Providence, R. I.....	1,034,881	7.09	11.21
⁴ Philadelphia, Pa.....	6,038,063	7.10	11.40
Newark, N. J.....	354,235	2.42	11.40
⁵ San Francisco, Cal....	59,803	.17	11.68
Cincinnati, Ohio.....	1,003,053	4.15	11.75
Toledo, Ohio.....	391,375	5.63	12.17
Milwaukee, Wis.....	431,709	2.04	12.51
Chicago, Ill.....	1,531,375	1.15	13.41
Detroit, Mich.....	195,178	.86	13.80
Rochester, N. Y.....	313,564	2.94	13.91
Albany, N. Y.....	273,218	4.67	13.93
Buffalo, N. Y.....	393,079	1.50	16.10
Louisville, Ky.....	237,600	2.00	16.40
Pittsburg, Pa.....	1,338,820	6.64	16.84
Baltimore, Md.....	2,018,834	5.57½	16.93
Allegheny, Pa.....	419,025	7.40	17.87
Minneapolis, Minn.....	394,655	4.55	18.60
New Orleans, La.....	1,391,999	1.14	21.65
Jersey City, N. J.....	108,858	1.56	24.85

¹Does not include removal of ashes.

²Does not include street cleaning.

³Does not include removal of ashes and garbage.

⁴Includes county.

From this table it will be seen that for municipal purposes only, including education, but exclusive of State, county and sinking fund and interest purposes, based on an assessable valuation arranged on a uniform basis, Indianapolis, Ind., has the lowest tax rate of all the cities enumerated, viz., \$6.62 per \$1,000, while Jersey City has the highest rate, viz., \$24.85.

Before passing from this subject I desire to submit two tables on the bonded indebtedness of these cities. First, a table showing the net bonded indebtedness of these cities on January 1, 1898, as well as the net bonded indebtedness per capita; and second, a table showing the amount of money produced by taxation in 1898 for bonded indebtedness and interest, as well as the amount produced per capita, as follows:

Name of City.	Net Bonded Indebtedness.	Net Bonded Indebtedness Per Capita.
San Francisco, Cal.....	\$133,917	\$0.38
Chicago, Ill.....	15,449,414	8.35
Indianapolis, Ind.....	2,030,500	10.41
Denver, Col.....	1,955,300	12.22
Detroit, Mich.....	4,679,897	15.59
Kansas City, Mo.....	3,513,080	20.07
Omaha, Neb.....	3,036,000	20.24
Columbus, Ohio.....	3,181,961	23.50
Cleveland, Ohio.....	9,079,732	23.89
Milwaukee, Wis.....	6,728,000	24.91
Toledo, Ohio.....	5,064,616	30.88
Minneapolis, Minn.....	6,821,754	32.48
¹ St. Louis, Mo.....	20,352,278	32.66
Albany, N. Y.....	3,269,000	32.69
Nashville, Tenn.....	3,307,000	33.07
Buffalo, N. Y.....	14,157,819	37.76

Louisville, Ky.....	8,584,000	38.66
Pittsburg, Pa.....	11,571,679	39.22
Allegheny, Pa.....	4,953,703	39.62
Newark, N. J.....	11,057,774	44.23
Philadelphia, Pa.....	56,872,795	45.87
Rochester, N. Y.....	8,081,959	46.18
New Orleans, La.....	14,444,390	48.18
St. Paul, Minn.....	8,922,483	54.07
Cincinnati, Ohio.....	25,482,459	62.15
Baltimore, Md.....	31,794,178	63.58
Jersey City, N. J.....	15,491,542	70.74
Providence, R. I.....	12,972,145	78.14
Boston, Mass.....	51,482,168	97.33

also the per capita amount raised by taxation, the calculation being made by dividing the amount raised by the population of each city.

Name of City.	Amount of Money produced by Taxation in 1898 for Bonded Indebtedness, including Interest.	Amount of Money produced by Taxation in 1898 Per Capita.
San Francisco, Cal.....	\$59,803	\$0.17
Jersey City, N. J.....	108,858	.54
Detroit, Mich.....	195,178	.60
Omaha, Neb.....	190,063	.72
Kansas City, Mo.....	135,500	.77
Chicago, Ill.....	1,531,375	.82
Buffalo, N. Y.....	393,079	1.04
Louisville, Ky.....	237,600	1.07
Cleveland, Ohio.....	411,554	1.08
Denver, Col.....	219,304	1.37
Newark, N. J.....	354,235	1.41
Milwaukee, Wis.....	431,709	1.60
Rochester, N. Y.....	313,564	1.79
St. Paul, Minn.....	307,365	1.86
Minneapolis, Minn.....	394,655	1.87
Columbus, Ohio.....	297,127	2.20
St. Louis, Mo.....	1,415,954	2.27
Nashville, Tenn.....	230,096	2.30
Toledo, Ohio.....	391,375	2.38
Cincinnati, Ohio.....	1,003,053	2.44
Indianapolis, Ind.....	508,201	2.60
Albany, N. Y.....	273,218	2.73
Allegheny, Pa.....	419,025	3.35
Baltimore, Md.....	2,018,834	4.03
Pittsburg, Pa.....	1,338,820	4.53
New Orleans, La.....	1,391,999	4.63
Philadelphia, Pa.....	6,038,063	4.95
Providence, R. I.....	1,034,881	6.02
Boston, Mass.....	4,268,579	8.06

From these tables it will be seen that Philadelphia has the largest bonded indebtedness, viz., \$56,872,795.22, while San Francisco has the smallest, viz., \$133,917.01. In the bonded debt, per capita, Boston is the highest, with \$97.33, while San Francisco is the lowest—38 cents. The average per capita debt of these cities is \$37.48, fourteen cities being above and fifteen below the average.

Philadelphia raises more money by taxation per annum to provide for its bonded indebtedness, including interest, than any of the cities enumerated, viz., \$6,038,063, while San Francisco raises the least, viz., \$59,803. The amount of money raised per capita by taxation to provide for the bonded indebtedness, including interest, is \$8.06 in Boston, this being the highest rate, as against 17 cents in San Francisco, this being the lowest rate. The average per capita amount raised by taxation is \$2.37, eleven cities being above and eighteen below the average.

The next table shows the amount of money produced in these cities in 1898 by taxation for all purposes—State, county, municipal, educational, and sinking fund and interest—not including, however, moneys received for these purposes from sources other than taxation, and showing

Name of City.	Amount of Money raised by Taxation for all Purposes.	Per Capita Amount of Money raised by Taxation.
Nashville, Tenn.....	\$867,285	\$8.67
Kansas City, Mo.....	1,777,760	10.15
Toledo, Ohio.....	1,676,600	10.22
Omaha, Neb.....	1,557,457	10.38
St. Louis, Mo.....	6,584,186	10.56
Indianapolis, Ind.....	2,093,308	10.73
Cleveland, Ohio.....	4,158,122	10.94
Newark, N. J.....	2,905,839	11.62
St. Paul, Minn.....	1,990,200	12.06
Chicago, Ill.....	22,390,567	12.10
New Orleans, La.....	3,758,397	12.19
Milwaukee, Wis.....	3,345,080	12.38
Columbus, Ohio.....	1,692,497	12.53
Cincinnati, Ohio.....	5,149,006	12.55
Louisville, Ky.....	2,809,620	12.66
Philadelphia, Pa.....	15,993,546	12.91
Jersey City, N. J.....	2,599,923	13.00
Minneapolis, Minn.....	2,741,358	13.04
Detroit, Mich.....	3,992,856	13.39
Rochester, N. Y.....	2,338,198	13.41
Albany, N. Y.....	1,365,537	13.65
Denver, Col.....	2,266,146	14.10
Allegheny, Pa.....	1,883,725	15.06
Buffalo, N. Y.....	5,783,180	15.42
San Francisco, Cal.....	5,962,740	17.04
Baltimore, Md.....	8,826,741	17.65
Providence, R. I.....	2,995,709	18.04
Pittsburg, Pa.....	6,332,620	21.46
Boston, Mass.....	14,090,458	26.64

From this table it will be seen that for all purposes combined Chicago raises the most money, viz., \$22,390,567, while Nashville, Tenn., raises the least, viz., \$867,285. The highest per capita amount assessed for all purposes by taxation is \$26.64, in the city of Boston, while the lowest amount is \$8.67, in Nashville, Tenn.

The appropriations or estimated expenditures for police, fire, light, street cleaning and educational purposes in 1898, for the various cities, are shown in the following table:

DEPARTMENTAL EXPENDITURES, PER CAPITA.

Cities.	Police.	Fire.	Light.	Street Cleaning.	Educational.
Boston.....	\$3.19	\$2.21	\$1.23	\$.60	\$4.67
Philadelphia.....	2.18	.79	1.06	.73	3.24
San Francisco.....	2.11	1.23	1.00	.39	3.52
Buffalo.....	2.06	1.67	.91	1.06	2.57
Providence.....	2.02	2.11	1.69	.42	3.16
Jersey City.....	1.98	1.09	.66	.26	2.01
Baltimore.....	1.96	1.01	.75	.77	2.86
Chicago.....	1.80	.80	.55	.33	3.32
Detroit.....	1.78	1.86	.41	.43	3.06
Albany.....	1.59	1.41	.88	.42	2.97
Pittsburg.....	1.55	1.39	.85	1.14	2.62
St. Louis.....	1.54	1.20	.61	.38	3.14
Newark.....	1.48	.96	.80	.38	1.96
Cincinnati.....	1.40	1.07	.82	.46	3.11
Milwaukee.....	1.22	1.54	.70	.57	2.67
St. Paul.....	1.12	1.21	.69	.30	2.58
Allegheny.....	1.09	1.05	.84	.84	3.04
Minneapolis.....	1.06	1.64	.81	.64	5.38
Cleveland.....	1.04	1.28	.60	.42	3.78
Louisville.....	1.02	.93	.53	.37	1.54
Kansas City.....	.98	1.13	.40	.40	3.43
Columbus.....	.96	1.33	.54	. .	3.52
Rochester.....	.95	1.31	1.31	1.41	3.25
Nashville.....	.87	.87	.53	.25	1.80
New Orleans.....	.79	1.02	.70	.70	1.29
Toledo.....	.78	.76	.27	.20	2.35
Denver.....	.77	.88	.58	.29	4.69
Indianapolis.....	.71	.85	.53	.28	3.58
Omaha.....	.61	.62	.32	.14	2.80

The following table shows the estimated receipts in 1898 for liquor, street railroad and general and vehicle

licenses, only that portion of the income applied to maintaining municipal departments being shown, however:

Cities.	Total Estimated Receipts for Liquor License, including Tobacco, Portion.	Per Capita Amount Received.	Total Estimated Receipts for Railroad License and Fees.	Per Capita Amt. Received	Total Estimated Receipts for General and Vehicle License	Per Capita Amt. Received
Boston	\$1,085,000	\$2.05	\$500	..	\$44,500	.08
Omaha	268,000	1.79	..	..	24,000	.16
St. Paul	275,000	1.67	..	..	9,000	.05
Chicago	3,025,418	1.64	80,532	.04	..	..
Pittsburg	480,000	1.63	30,000	.10	185,000	.63
Albany	157,000	1.57	..	..	4,386	.04
Buffalo	580,000	1.55	46,000	.12	45,000	.12
St. Louis	945,000	1.52	92,100	.15	434,000	.70
Minneapolis	299,000	1.42	3,700	.02	13,992	.07
Philadelphia	1,690,047	1.36	77,744	.06	93,204	.07
Newark	335,000	1.34	4,000	.02	16,500	.07
Jersey City	255,908	1.28	..	..	8,781	.04
Allegheny	160,000	1.28	25,000	.20	82,490	.66
Milwaukee	333,590	1.23	48,676	.18	53,449	.20
Denver	195,400	1.22	4,000	.03	40,758	.25
Cleveland	427,000	1.12	7,800	.02	28,200	.08
San Francisco	380,000	1.08	10,000	.028	112,000	.32
Cincinnati	427,000	1.04	180,000	.44	110,800	.27
Rochester	174,000	1.00	..	..	..	..
Baltimore	410,000	.82	266,000	.53	65,000	.13
Detroit	225,000	.75	22,000	.07	16,000	.05
Indianapolis	140,016	.72	..	..	50,148	.26
Toledo	100,000	.61	..	..	22,000	.13
Kansas City	102,000	.58	9,000	.05	107,000	.61
Louisville	126,455	.57	30,863	.14	120,693	.55
Columbus	70,000	.52	..	..	350	.03
New Orleans	149,000	.50	8,000	.03	168,000	.56
Nashville	17,250	.17	2,150	.02	83,000	.83

WATER SUPPLIES FOR TOWNS AND COUNTRY PLACES.

BY ARTHUR W. PALMER, SC. D., PROFESSOR OF CHEMISTRY, STATE UNIVERSITY OF ILLINOIS.

It is a fact that perhaps half the population of Illinois and other States depend for their water supply upon water obtained from the ground. It is stated by those who have looked into the matter thoroughly that there are more than half a million of ordinary house wells in our State, and I think it not at all unreasonable to assume that at least a third of the citizens of the State of Illinois drink water taken from shallow wells in the vicinity of their homes, or in some few instances drink cistern water. Of course in Chicago and in the larger towns a general system of water supply yields the drink for perhaps most of their inhabitants, but even in these places the number of citizens who use water from their own shallow wells is by no means inconsiderable.

The original source of all water may be regarded as rain. This, water-vapor, existing in the higher regions of the atmosphere, placed there through the influence of the sun's rays, upon coming in contact with cold air, suffers condensation, and comes to the surface of the ground in the form of drops as we recognize the rain. It is true, perhaps, that rain water is distilled by nature, and that, as provided by nature, it is perfectly pure and wholesome; but men have so modified nature by segregation and by gathering together into communities, and by their inventions and industries, that she is no longer allowed to work entirely upon her own original plan, and some remedy for this state of affairs is needed. Under the very best of circumstances, far from large communities and away from such manufactories as discharge unwholesome or noxious vapors into the atmosphere, rain water may under proper conditions be obtained in a comparatively pure and wholesome condition. But even here it is never absolutely pure, even when one catches only that portion which has fallen in the latter part of the downfall. After the atmosphere and the collecting surfaces have been washed by long-continued rain, even under such circumstances rain water still contains impurities which are derived from the atmosphere and from the collecting surfaces. These

impurities consist mainly of chemical substances which are normal constituents of the atmosphere, and they are not so particularly objectionable as are those impurities which are contained in the air at other times than just after a long-continued rain. However, for practical purposes we cannot collect rain water under these conditions, and for ordinary purposes then we must expect to use water that contains considerably more of these foreign substances than does the best water, which, under exceptional conditions, can be obtained from these sources.

As commonly caught, rain water contains impurities which are normal to the atmosphere, even in the places where the atmosphere itself is the purest; and in addition all such solid and gaseous matters as are brought into the air, such as emanations from the earth, from the barn-yard and from the dust blown up into the air from our roadways, germs given off from fecal matters, from the breath of animals, both human and lower, and various other substances from numerous different sources. Under ordinary circumstances, too, rain water caught upon the roof will gather from the roof or whatever surface may serve to collect it, considerable matter resulting from the depositions of the excrement of birds, dead leaves, refuse, etc., aside from the dust blown up from the roads, so that the water as it is delivered to the cistern, even under the best of conditions, will contain numerous foreign substances, many of which are of such nature as to undergo putrefactive change. The most objectionable things derived from these sources are spores and germs. These being contained in the soft cistern water, which also contains the other matters mentioned, are in a medium in which they may be fully developed and multiplied. It is true that these things may be removed by proper filtration, but the ordinary filter is not thoroughly efficient. These substances may be rendered inert by boiling, but the boiling must be thorough, and the water must not be kept long after boiling unless it be hermetically sealed or otherwise protected, because water that has been boiled is oftentimes rendered thereby yet more susceptible to the influence of impurities, and germs which fall into it from the air about or spores which have not been all destroyed by boiling, develop in the water and render it again dangerous. However, the matter of rain water need not detain us very long. Comparatively few people depend on rain water for their drink, yet it would be well to call attention to the fact here, perhaps, that if proper care is exercised so that only the best of the rain water is gathered for the cistern, and that it is well filtered before reaching the cistern, and the cistern kept thoroughly clean and cold, then the water so obtained may be kept in a wholesome and safe condition and be used continuously for drink without becoming at any time a menace to health, but the care necessary will involve the collection of the water only in the latter part of showers and the complete exclusion of all portions of rain water until the roof and atmosphere have been thoroughly washed. A renewal of the filtering substances should be made at least once every six months, and the cistern must be thoroughly cleaned no less often. If this care is taken it is perfectly possible to obtain cistern water or rain water which is above suspicion.

Concerning well waters I may say that at the State University we have been engaged in a series of examinations of waters from all sorts of sources within the State, during the last three years, and that during this time we have made analyses of 4,100 different lots of water, including water coming from all the different sections of the State, so that from the results of these studies we have been able to obtain a fairly good idea of the proportion of the difficulties and dangers attending the use of water drawn from the ordinary shallow well.

To begin at the beginning, although any part of the cycle might be considered a beginning, let us commence with the consideration of the ground itself, or at least consider a certain popular idea regarding it. People generally seem to hold to the view that any liquid which has filtered through the soil is efficiently purified, and thereby rendered wholesome, but the facts do not warrant this supposition; on the contrary, they show that it is most fallacious. The large sand-bed filters which are employed for the purification of surface waters used for the supply of numerous large cities in this and in other countries perform their function in quite a different manner from that in which the soil is supposed by many to purify liquids which filter through it. In the first place, in a proper sand-bed filter it is essential that there be no rifts or breaks in the layers of sand; rifts such as are not only common but are almost characteristic of our soils and subsoils. Further, where a filter is of sand or gravel, this constitutes merely a support for the real filtering material. When a filter is first prepared it is necessary, after the material is all in place, to run water through it sometimes for several weeks before it begins to work in the desired manner. The real filtering material in a sand filter consists of what may be called the slime coat, which is formed in the upper part of the sand layer, partly upon the surface of the sand and partly penetrating some little distance within the stratum. This slimy coating consists of various organic matters or organisms which begin to attach themselves to the sand as the water is first turned on; to these are attached other slimy matters, collecting still others as the water continues to go through, all growing together and developing greater numbers of minute organisms, which, finally, coalesce and form a thin, slimy stratum, a gelatinous organic and partly living material, and it is this which constitutes the real filter. As the use of the filter proceeds these matters either become so dense that they no longer permit the water to pass through, or they penetrate through the sand, and are no longer kept out of the water, or breaks occur in the surface or in the sand itself at points of the least resistance, through which the water passes unpurified. When one or all of these conditions become prevalent the filter must be renewed. That is, the layer of sand constituting the upper stratum must be removed from the filter and exposed to the air until natural putrefactive processes eventuate in the total destruction of the organic matters, and the purified sand is then again placed in the filter bed or fresh sand is put in the place of that removed. Large filters of this sort run in service from three or four to six or eight months, and then a complete renewal is necessary. Natural filtration through the soil is not at all of this sort. In the first place there are generally shallow rifts of one sort or another which permit the flow of water through the soil in a manner quite different from the slow percolation which constitutes the main feature of the sand filter. Further, there is no renewal of the material which has become charged with refuse matters, and these refuse matters penetrate farther and farther, eventually reaching the well. But the user of well water will say that the water in his well is always clear, colorless and palatable, and cite these characteristics as being evidences of the wholesomeness of the water and as evidence further of its freedom from objectionable matters. His security is only delusive. The earth indeed readily removes all solid matters which are in suspension, so that the water filters through clear and sparkling, but it is not these suspended matters which are the particular source of danger. The sources of danger in all cases are the minute organisms, so small as to be altogether invisible to the naked eye, and to require a very powerful microscope to make it at all possible that the eye shall see and distinguish them. These things are known to pass for considerable distances through the earth, and to pass

through soil strata which remove absolutely everything which is visible to the naked eye; consequently water in which nothing whatever can be distinguished by the naked eye may be charged with millions and millions of germs of one sort and another, including disease germs as well as the comparatively harmless germs which are natural to the soil. Even under the best of conditions, then, soil cannot be regarded as an efficient means of removing disease-producing germs.

But there is another complication. It is, particularly throughout large portions of our State, impracticable for one to be sure that his well is not contaminated, except he knows all about the surroundings and the strata beneath the surface for some considerable distances in all directions. To get an idea regarding the state of affairs which exists beneath the surface, that is an idea of the arrangement of the various sorts of earth, recall for a moment the appearance of the ocean or one of our great lakes after the waters have been stirred and tossed by a storm, and then imagine the whole mass of water suddenly, instantly, congealed. A surface so fixed would in some degree represent the surface of the strata of many parts of our State as they were laid down by the glacial and diluvial action in past ages. Further, imagine this same thing occurring again and again as new deposits are superimposed upon those already in place. You can thus gather some notion of the general arrangement of the clays, sands, gravels, etc., which constitute the drift and the alluvial deposits which cover nearly the entire surface of our State to depths ranging from almost nothing up to 250 or 300 feet. But you may say that the present surface does not resemble the storm-tossed sea, congealed. Perfectly true, for the surface has been smoothed off by rain, wind, and other erosive agencies, so that while it is still usually undulating and in part hilly, it does not give an adequate idea of the actual confusion of the strata which lie beneath. But what is the bearing of all this? When we remember that the water-bearing strata are usually porous rocks or sands and gravels, and that these are separated from each other frequently by strata of clay, we are in a position to consider the agencies and circumstances which may affect the purity of the water drawn from such strata. A well in any given locality may furnish a supply of water drawn from sand or gravel strata which lie beneath clay strata. This is perhaps the most usual sort of ordinary well, and the owner of such a well usually thinks that because he has impervious clay above the water-bearing stratum that there is no danger of pollution from surface sources or from cesspools, privy vaults, drains, and so on, which lie above or in the clay. The fact is that this particular stratum of clay may extend horizontally only a short distance, and that a little way off the water-bearing stratum, which at this well is some distance beneath the clay, may come right to the surface and be itself the recipient of refuse matters and drainage. This, which we know to be the case very often in this and adjacent States, is the real source of danger. And the danger is increased from the fact that one well so polluted may furnish to these contaminating substances access to a stratum which supplies other and more favorably situated wells.

It is a known fact that there are in many localities basin-like depressions in the strata which are entirely concealed from one on the surface because of the surface having quite a different conformation. It is known, too, that in certain cases these basins have served as large cesspools for the collection of drainage from refuse animal matters of all sorts, and that disease has been spread by the use of water from wells located within these basins and drawing their supply from the drainage thus collected. Furthermore, this state of affairs is likely to recur wherever the conditions beneath the surface are such as they seem to be throughout large areas in the Mississippi

valley. Wherever there are species of wells which can be affected by these conditions, or wherever the surface is permitted to become a dumping ground for refuse matters of various sorts, whether from barn yards, privy vaults, cesspools or drains, there the condition must become dangerous.

It has been shown by experiments in England that typhoid bacilli in garden earth have lived as long as forty-two days, and cholera germs have lived for sixty-eight days under similar conditions. We can easily understand, consequently, the danger which may arise from the throwing of dejecta from typhoid fever or cholera patients anywhere where they may come in contact with the earth. Such matters, of course, should be burned, and so completely destroyed. If they come in contact with the earth in any locality where water is taken from a stream or from the ground, the conditions become such as to cause very grave danger to the health of people in the community. It should be noted also that those particular formations which are the best water bearers are the most liable to pollution and the dissemination of impurities, for the reason that rocks and soils which may hold and readily yield considerable volumes of water must of necessity be porous and easily penetrable by water; and if they are penetrable by water it is obvious, from what I have stated above, that they are also penetrable by the disease germs which occasion the danger and the menace to health.

The sort of well which will be least open to the reception of such dangerous things will be, of course, the deep well, and such a well as can by no possibility receive water from other strata than the deeper lying ones. The custom of digging a well of greater or less depth and bricking up the sides dry is most reprehensible, for under such conditions the well becomes a natural drain pit for all the fluids in the neighborhood, and will most inevitably receive much which is objectionable.

If the brick or stone lining the sides of the well is set up in cement, and impervious clay so rammed down behind the brick or stone work as to prevent the access of other water than that obtained from the lowest lying strata, thus excluding all surface drainage or drainage from strata nearer the surface, the well will probably continue to yield a wholesome supply of water, but if a neighbor's well reaching to the same stratum is left in such condition that it may receive drainage from refuse matters, then the first well, although itself properly built, will doubtless also become a source of danger. Two wells drawing water from one and the same stratum must of necessity be in communication with each other, and contamination of one is likely to produce pollution of the other. This must be inevitable unless the source of contamination is promptly excluded. In case it is impracticable to cement the brick or stone work, it is possible to ram down wet blue clay into such a condition behind the well as to form a tolerably efficient dam, shutting off all objectionable drainage. It must be understood, however, that in both cases the well is only dammed, and that breaks in it, as soon as they give access to the deep pit of the well, will result in admitting drainage from all permeable strata which lie above, and since water seeks the lowest level, these permeable strata may bring to the well refuse matters from very considerable distances, for within the permeable stratum all sorts of objectionable drainage may flow upon the surface of the clay or other impervious strata.

The driven well, having the water-tight tube fitted tightly to the hole in which it is rammed, constitutes the well which ordinarily may be regarded as best, provided there are no open wells in the immediate vicinity drawing water from the same strata. A driven well of this character will itself be perfectly unobjectionable, and cannot di-

rectly receive those refuse matters which are the source of so much discomfort and disease. It is evident, then, that the danger arising from the use of well water is not entirely due to the circumstances pertaining to the individual shallow well, but rather to the conditions prevailing throughout the locality in which the well is situated.

If one man pays proper attention to his own well and assures himself that all that is possible for him to do has been done, nevertheless he may not in all cases rest secure in the belief that his water supply cannot become a menace to health. If his neighbors are careless or neglectful or do not understand these matters as he does, they indeed are likely to be the first sufferers from their neglect, but not they alone; for the careful man, having no control over the acts of his neighbors, is often just as severely damaged as they are.

It has been shown by sanitary experts that in country places the mortality from such diseases as are particularly conveyed through the medium of water is much greater than in the larger cities supplied by a general system of water works, overseen by experts, although the water supply in these larger cities may be constantly under suspicion, and the people be constantly warned that they must boil the water in order to use it with impunity. Of course these warnings have a great part in keeping down the mortality, for, although many people may pay no attention to them, yet a large proportion of the citizens of an American city or State are sufficiently intelligent to give heed to the advice of those who have made these matters a study, and they profit thereby.

What can be done about the numerous ordinary shallow wells in country places and villages it would require considerable discussion and study to determine; but it seems to me that the matter is one that should receive the attention of our boards of health, and a possible remedy for existing evils might be found in a collation of information regarding various house wells throughout the State and perhaps by licensing the well diggers. The physician must be licensed, the architect must be licensed, the plumber must be licensed, the engineer, the huckster, the peddler, and so on, must be licensed; but those who sink wells which are to furnish the water supply for families are not supervised in any adequate manner. I do not think that this is a project which would arouse antagonism or difficulty. It is not suggested for the purpose of annoying the well diggers or their patrons. Well diggers and their patrons must both be regarded as, in fact they are in general, intelligent human beings. The purpose of the licensing which I have suggested would be twofold. First, to see to it that wells are constructed in a proper manner—that is, they may be built in such a manner that it may be impossible for surface drainage or drainage from any of the upper strata to enter. Second, that attention may be given to the surroundings; that the well diggers in certain localities may be expected to know not merely that they can or cannot get water in certain places, but also to know whether sewage of any sort, from cesspools, privy vaults, or barn-yards or any other source, enters the ground in the localities in which they are doing business.

The State water survey has been in progress at the University of Illinois during the past three years, under the direction of the department of chemistry. The aims of the survey are to determine the condition of the water supplies used by the people of the State, and particularly to call attention to any abnormal condition or pollution such as usually results in the development of disease. The work has been carried on systematically and has included examinations of samples collected at regular periods from various sources throughout the State. Of the total number of analyses made up to date (about 4,100), 1,600 have been made at the request of various private parties,

and the work has included the complete mineral analysis of 115 different waters. In addition to the sanitary questions which are considered, the survey also gives information regarding the suitability of water for industrial purposes, as, for instance, the suitability for use in the laundry, in steam boilers, and so on. It is to be hoped that in the future plans may be so developed and provided for that the work may be extended to all sections of the State in such measure that full information regarding the water supplies throughout the entire commonwealth may be obtained.

THE PROPER CURBING OF STREETS.

BY HORACE ANDREWS, CITY ENGINEER, ALBANY, N. Y.

The methods of improving city streets have attained such a degree of development that further progress toward perfection must be necessarily slow, and can best be assured by a careful examination of each item entering into street construction.

We can realize the present excellence of modern streets by looking backward to the times, not so very remote, when the condition of the streets in London was far worse than anything we would now tolerate. At the close of the reign of Charles the Second, about 1685, when London was a city of about 500,000 inhabitants, its streets were in a state thus graphically described by a distinguished historian:

"The pavement was detestable * * * The drainage was so bad that in rainy weather the gutters soon became torrents. * * * This flood was profusely thrown to right and left by coaches and carts. To keep as far from the carriage-road as possible was therefore the wish of every pedestrian. The mild and timid gave the wall; the bold and athletic took it."

The conditions depicted are sufficiently appalling, and we might anticipate that the rapid advance of civilization would soon lead to radical reform. However, at a date eighty years later, so little progress had been made that we find the state of London streets described as follows: "Foot passengers are protected by rows of posts at intervals of four or five feet. Flat paving-stones are not in general use, and those that have been laid down are small and insecure. * * * The only pavement both for the road and the footway consisted of large, round pebbles, over which the rolling of the vehicles made the most dreadful noise. In the year 1762, however, an improvement was introduced in Westminster, followed by the city of London in 1766.

"The roads were paved with squares of Scotch granite laid in gravel; the posts were removed; a curb was laid down, gutters provided, and the footway paved with flat stones."

Here we see the beginning of our present raised sidewalks, and can realize the painful inconvenience, endured for so many years, on account of their absence.

To retain the sidewalk at its proper elevation and to help form the gutter, the curbstone was used. It is the purpose of the writer to call attention to this detail of street construction to which, frequently, little thought seems to be devoted.

The functions of a curbstone are such that great stability should be ensured, yet we often perceive that both permanence and strength are disregarded. Frequently specifications for pavement of the roadway call for excellent and expensive work, while the curbstone is either left to be furnished without extra cost, as an incidental, or a stone of most insufficient size is specified. A recent specification for sheet asphalt pavement in the streets of one of our large cities calls for a curbstone three inches thick, in lengths of four feet or over, and of such depth as to extend four inches below the surface of the pavement at the gutter, no special foundation being mentioned.

Let us consider the disturbing forces that tend to displace the curb and destroy its alignment. The pressure of the earth behind the curb, frequently augmented by heavy surcharges from piles of merchandise on the sidewalk, tends to overturn it. This pressure also tends to break the curb transversely or to cause it to slide bodily on its base. In our northern cities the most severe disturbing action is due to the freezing of the ground beneath the sidewalk. The pressure from the expansion of freezing earth behind the curb is most apt to occur where the sidewalk is partly sodded and the ground is accordingly moist. Successive freezings of the earth behind the curb will occasion a succession of thrusts forward till the curbstone, when of faulty design, is sometimes inclined 60° or more from the vertical.

The ground below the curb is also upheaved by frost at places where the subsoil can become saturated through percolations from the sidewalks or permeable pavements on the roadway. The displacement from beneath tends to alter the height of the curb and to impair its appearance seriously. It is of importance that the height of the curb should be permanently maintained, as it serves for the regulation of the cross-section of the roadway and sidewalks and for fixing the elevations of the houses. Where the sidewalks are sodded, and especially where the curb is of small cross-section and improperly supported, tile drainage may be of benefit; the writer has found it possible to secure stability without such drainage, even with sodded walks. Drainage may sometimes be a desirable safeguard, but great care should be exercised lest the soil should be so loosened in constructing the drain as to cause the curb to drop out of alignment. Posts and trees set too near the curbs tend to break and destroy the latter. Fires built in the gutters will deface and will seriously damage granite curb. The constant blows from wheels in narrow business streets will slowly destroy even the most substantial stone. To withstand the destructive impact of wheels curbs are faced with iron at certain places in the streets of London, and a concrete curb with a rounded edge of steel has been patented and used to some extent in this country.

The municipal engineer must seek a means of guarding against the destructive action of the various agents referred to, and at the same time he should endeavor to avoid an expenditure so great as to be oppressive. Where stone can be readily procured the writer believes this to be the best material for the visible portion of the curbstone, and that the best kind of stone is granite of good quality. To render such curbing economical it should have a cross-section of moderate size; to insure its stability it should be reinforced with concrete. For æsthetic considerations the stone should be sufficiently well dressed to present a neat and uniform face and top surface. Granite has the advantage over most stone of looking well, even if somewhat roughly faced.

The comparative cheapness of concrete should lead to its liberal use, and in case stone is difficult to procure the entire curb may be formed of concrete. Such curb will never convey as good an impression as when formed of natural stone, nor will it resist the wear of vehicles as well. Concrete curbing must be made with extreme care, and with the best materials, but concrete used merely for adding to the stability of a stone curb need not be of better quality than that employed for the pavement foundation.

The curbstone should have a thickness at least equal to the depth of the gutter in order not only to be stable, but to appear so. In many cities abroad curbstone of as great a thickness as twelve inches is employed, and in Washington curbstones eight inches thick and eight inches deep are used. The occasional use of gutters of a depth of eight inches or greater, especially at receiving basins, might render a depth as small as eight inches in-

sufficient. The writer is opposed to the use of a gutter stone. It is generally an unnecessary expense, and the longitudinal joint between it and the pavement is much to be condemned. In narrow and heavily traveled streets every longitudinal joint having a length as great as one or two feet is sure to become a rut under the wheel traffic.

A concrete curb, with gutter formed in one piece, is admirably adapted to secure stability, but is open to objection for the reasons stated. The end-joints of curbstones should be so cut as to look well from the top and front. They should be substantially square, but need not be cut precisely so for the entire thickness of the stone. In Liege, in Belgium, the curbstones, seven and one-half inches in width, are tongued and grooved at the ends, and a similar construction is seen in front of the Public Library in Boston. It is needless to say that such construction is merely an oddity, and is an unnecessary expense. The Liege curbstone is an interesting example of the development of one detail of street construction with the neglect of others of greater importance; for in that city, the sidewalks, like the roadway, are paved with cubes of stone, four and a half inches on a side, concerning which a writer pathetically remarks: "One could wish himself shod in iron to escape the discomfort and pain caused by the inequality of these torturing cubes."

In setting the curbs it is well to keep the ends from actual contact; for this purpose strips of hoop-iron can be temporarily inserted between the ends of the curbs as they are set.

Specimen curbs should be placed on exhibition and referred to in the specifications. The pattern curbs should be dressed in every respect in accordance with what the engineer desires, and with due regard for what is practically attainable without excessive cost.

The foundation of the curb should be of concrete, having a depth of six inches. The depth of the curb should be such that the concrete under it will be nearly continuous with that under the street pavement.

The concrete placed behind the curb should have a thickness of six inches, and should be brought to a level surface about three or four inches below the surface of the sidewalk. The layer of concrete under the pavement will then pass beneath and up behind the curbstone, affording an excellent support at a moderate cost, a cubic yard of concrete making foundation and backing for about thirty feet of curb. Concrete should have a slight excess of mortar, and should be composed of hydraulic cement, sand and stone in small pieces. It will then be possible to consolidate it without disturbing the alignment of the curb. A mold should always be formed for the concrete. For that beneath the curb a piece of 6 by 6-inch timber, placed in front of the bed, answers very well, and can be removed when the concrete is set. Boards, one inch thick, and left permanently in place, can be used for shaping the back of the concrete. Where a street is to be re-paved the old curb may often be used to advantage in place of boards for backing the concrete.

The lengths of the individual pieces of stone should not be less than three and one-half feet. Contractors usually furnish stones considerably longer than this, as the labor of dressing joints is thereby reduced.

The appearance of street corners is much helped and vehicle traffic is facilitated by the use of circular curb of large radius. The writer for several years used a radius of 5.73 feet, which gave a length of curve of a tenth of a foot for each degree of centre angle. This radius has more recently been increased to eight feet.

The numerous driveways crossing the sidewalks should have small, circular corners. For these a radius of about two feet is a convenient one. Where streets are not laid out on a rectangular system the angles which the curb-lines make with one another should be carefully measured in advance, and in all cases the circular curb

should be cut to the proper length to join the tangents neatly.

In the city of Albany, N. Y., an effort has been made for several years to improve the quality and to increase the stability of the curb. The resulting appearance of the streets has been a source of satisfaction to the property-holders as well as to the city engineer.

About forty-seven miles of curbstone have been laid with concrete foundation. None of this curb exceeds fifteen inches in depth, yet its alignment is much better than that of the former twenty-inch curb on sand foundation. The first granite curb was laid, on concrete, in 1889. It was five inches thick and twelve inches deep, costing \$1.25 per foot. The subsoil was blue clay, yet the curb has kept its height and alignment very well. The thickness of the standard curb is now six inches, the depth remaining twelve inches. About 5 1-3 miles of the five-inch granite curb have been laid, while thirty miles of the six by twelve-inch granite curb are now in place.

The granite curb as quarried costs about 22 cents per lineal foot, delivered in Albany, coming by rail from Vermont and New Hampshire. Contractors have often laid it at prices too small to afford any profit, making up their loss on other items. Thus in 1897, 9.16 miles of six by twelve-inch granite curb were laid at an average price of 39 cents per lineal foot for straight curb and 47.7 cents for circular. This year 7.62 miles of the standard curb have been laid at an average price of 52.5 cents per foot for straight and 76.4 cents for circular. The above prices include concrete and all incidental work.

Under the laws of the State of New York all curbstones used by a municipality must be dressed within the limits of the State. Practically this requires all granite curb to be dressed within the city. The result in Albany has been a favorable one. The employment of citizens has met with popular approval. The opportunity of purchasing curb in its rough state is not confined to one or two quarries, whereas the number of quarries turning out dressed curb is very limited. The cost of the curb to the contractor has therefore been materially lessened since the passage of the law referred to.

In conclusion, the writer would urge that substantial and handsome curbstone be used on all well-paved streets. Without such curbing the best pavement looks somewhat inferior, and may be compared to a poorly framed painting. Civic pride can only be aroused and municipal improvement can best be insured by special attention to those details that appeal most directly to the eye, and a proper curbstone is not an insignificant detail.

—The New York Filter Manufacturing Company has started out after the scalp of Powell Jackson, doing business as the Jackson Filter Company, of St. Louis. The New York company claims that the Jackson filter is being manufactured and operated in violation of its patent rights covering the use of a coagulant such as alum or sulphate of alumina in connection with water filtration. Suit has begun in the United States Circuit Court at St. Louis to enjoin the Jackson concern. The New York Filter Manufacturing Company and the O. H. Jewell Filter Company, sole licensees, announce their intention to prosecute all users of so-called Jackson filters unless suitable indemnity for infringement is paid within a reasonable period.

—Brockton, Mass., has contracted with the Manchester Locomotive Works for one of their latest improved second size Amoskeag steam fire engines.

—Pittsburg, Pa., has contracted with the Manchester Locomotive Works to rebuild Engine No. 17, in the latest improved Amoskeag style.

THE SEWERAGE OF BALTIMORE.

BY KENNETH ALLEN.

Strictly speaking, Baltimore has no sewerage system, although the city has spent in the past over \$4,000,000 in the construction of storm-water drains, and there are many private sewers. The city has suffered in consequence of the lack of proper sewerage for many years. I do not mean by this that the death rate is excessive—it is in the neighborhood of 19 per 1,000. But the use of cess-pools is a detriment to property, the want of sub-drainage in the business districts retards improvements, the use of the gutters for wash water is offensive to those unaccustomed to it, as well as a nuisance to all when obstructed by ice in the winter; and then there is no question but that the introduction of a proper system of sewerage would so improve the general sanitary condition of the town as to lower the death rate by at least one or two points. Dr. John S. Fulton, secretary of the Maryland State Board of Health, estimates that, with a population of 1,000,000, 373 lives would be saved annually by the consequent reduction in typhoid mortality alone.

When it is realized that such conditions exist to-day in a city of over half a million inhabitants; that of all our large cities New Orleans is the only other one remaining without sewerage facilities, while a beginning has already been made there in that direction; and when we remember that for the past forty years the city of Baltimore has had the matter under discussion, we must admit that the time is ripe for a change. It is believed that the citizens realize this fact and will before long take active measures to prosecute the work.

Before speaking of the proposed system, as outlined by the Sewerage Commission, I wish to state briefly the situation to-day.

In the first place cess-pools are almost universally used by rich and poor, great reliance being placed upon seepage into the soil to carry off the liquids. Of the remainder, some 50,000 gallons are removed daily by odorless excavators at a price of \$2.50 per load of 200 gallons, and then taken to one of two wharves designated for the purpose. Here it is delivered to a contractor for 25 cents a load and dumped into a barge holding, generally, 450 loads, or nearly 100,000 gallons. It is then conveyed in the barge by a tug to farming lands situated some eight or ten miles below the city, where it is sold to farmers or utilized on farm lands owned by the contractor.

It is pumped from the barge by powerful steam pumps carried on a special pump-barge into large pits dug by the farmer. These vary in size, but average perhaps 30 x 100 x 5 feet, and will hold about a barge-load each. The farmer pays for this \$1.67 per 1,000 gallons, or something over \$100 a load, and there is no trouble in disposing of something over 12,000,000 gallons a year at this price. The sludge left in the scow is shoveled into carts and taken by the farmer.

The liquid portion is bailed from the pit into tank carts when wanted by the farmer and sprinkled by him on the land. There is very little smell from either pits or the farm lands, although garbage disposed of on lands in the same neighborhood is very offensive.

The liquid is said to be more effective as a fertilizer than the sludge, but more transient in effect. The soil is heavy, containing much clay, and the crops raised are principally cabbage, kale, tomatoes, potatoes and spinach. The night-soil, it should be noted, is said to be applied to the crops some weeks before gathering.

I have described this system of night-soil disposal somewhat fully, as it is carried on by a system and on a scale which are unique in this country.

In topography the city is hilly, the northwest corner

rising to 460 feet above tide. The area is about 32 square miles, comprising 2½ square miles of water surface, 8 square miles of closely built up territory, 5 square miles of partially built up territory, and 16½ square miles of rural area and parks. Its surface has a decided slope toward the Patapsco River on the south, toward Jones' Falls—a stream which flows in a southerly direction through the heart of the city—and to several other streams of more or less magnitude, insuring a speedy and complete removal of sewage to the outfall.

In 1893 a commission was appointed by the mayor to "examine into the necessity for a more perfect system of sewerage for the City of Baltimore" * * * "together with recommendations as to the system to be adopted and the mode of carrying the same into effect."

This commission, which now consists of Messrs. Mendes Cohen, F. H. Hambleton and E. L. Bartlett, presented its report last winter after a thorough investigation of the problems involved, in which they were aided by the services of Consulting Engineers Rudolph Hering, Samuel M. Gray and General William P. Craighill.

The entire design was seen to depend, first, on whether the combined or the separate system should be adopted, and, secondly, on the method of disposal. Both of these decisions were controlled by the following considerations:

In the first place, the flow in the Patapsco, which can only result from the combined discharge of its small tributaries, is insignificant and entirely inadequate to effectually dispose of the sewage from a large city. Our consulting engineers estimated that it could be relied upon to dispose of the sewage from but 37,000 persons without danger of offense. Again, the tides, which may be availed of during the ebb to carry down stream sewage retained in reservoirs during the flood, are also quite inadequate for the purpose, rising and falling on an average but 16 inches, and, finally, aside from any possible danger to riparian interests from fouling the shores, there were the oysters of the bay to protect—a very important source of revenue to the State and one giving rise to an industry employing a great many men. Therefore the sewage, if discharged into the harbor, would have to be treated at an expense bearing some relation to its volume, or, if carried by an outfall sewer to the bay, the great distance would preclude the conveyance of storm-water as well, without prohibitory expense.

For these and other reasons, together with the fact that storm-water is already partially provided for by a number of large and costly drains, it was at once decided that the separate system was the only one to be considered, and that the problem before the commission was virtually boiled down to that of disposal.

It was found that either of three plans was available: dilution in Chesapeake Bay, chemical precipitation, or agricultural filtration on the sandy soil of Anne Arundel County, some eight or ten miles south of the city. Of these, the latter was agreed upon as the most perfect, because it would deliver, under proper superintendence, an effluent biologically and chemically pure. But unfortunately the cost of delivery by steel pipes under the Patapsco in a siphon a mile long and through a tunnel 8,000 feet in length, in addition to a greatly increased annual charge for pumpage, resulted in an estimated cost for construction of \$17,451,803 as against \$10,409,167 in the case of dilution; and for maintenance of \$966,843 as against \$355,191. This difference of over \$7,000,000 for construction and \$600,000 for maintenance made it incumbent on the commission to investigate the objections to dilution in Chesapeake Bay.

A party was made up and stationed on a schooner in the bay, where current observations were made from a steam launch, and sometimes from a tug also, by means of sextant observations on known points from the posi-

tions occupied by floats. The latter were yellow pine rods, 2 inches square in section, and from 6 to 8½ feet in length, carrying a flag with a number for identification at one end and a weight consisting of iron washers strung on a wire at the other. They were set out from known positions from 1 to 3½ miles east of what is known as the Rear Range Light of the Craighill Channel at all stages of the tide, and observations were carried on for a full month. The plotted course of these floats serve to indicate the possible dispersion and drift of the sewage, if discharged at the several points, and the conclusions reached were that, with the almost unlimited dilution from the watershed of the Susquehanna, exceeding that of any other river between the St. Lawrence and the Mississippi, there would be no question as to freedom from offense from the discharge of the sewage at a suitable point. Such a point was fixed at 2½ miles east of the said lighthouse and some 2 miles from the nearest shore, the tendency of the currents being to carry any sewage discharged there down the channel in the centre of the bay, as well as to insure a rapid dispersion or mixing. Also, from the fact that the nearest marketable oysters lie in beds or on "lumps" in comparatively shallow water, some 6 or 7 miles away from the proposed point of outfall, the danger of infection was believed to be so very remote as to be insignificant.

It was suggested that a discharge of sewage into the bay would be detrimental to fish life, to the crabs, which form a staple food product of the State, as well as to the oysters and other mollusks. In this connection the following statements of Mr. William M. Brown, Jr., chief engineer of the Metropolitan Sewerage Commission of Boston, regarding the discharge of forty million gallons of sewage daily into the bay, are of interest. He says: "Deer Island Bar, at the other end of which our Metropolitan sewer outfall is located, is visited by crabs and great quantities of star-fish and minute mollusks and snails. Entire sections of this bar near the outfall are covered by these minute bivalves as with a carpet. They are not edible. The only edible fish products within the range of our outfall known to me are the well-known varieties of cod and perch, which are found in abundance within 500 feet of the outfall and used by our employees and others. Great quantities of lobsters are also obtained nearby. Our employees for three years have maintained lobster traps within 500 feet of the outfall, and within range of half a mile it is estimated that there are two hundred others, the product of which is sold in the Boston market. Marston & Co., * * * the most extensive dealers in lobsters in this market, estimate that in Boston harbor within a range of one mile from our outfall and that of the Boston Main Drainage Works at Moon Island, 75 tons of lobsters are gathered annually for the Boston market."

All such assimilate sewage if fresh and convert it into perfectly good wholesome food. The reason why a densely polluted water, such as is found in Baltimore harbor, will destroy fish life is, not that the sewage is harmful in itself, but that the bacteria developed therein deprive the water of its oxygen upon which fish depend.

From all the evidence collected and a study of the subject from a biological point of view as well, the commission felt justified in recommending this less costly scheme, and so reported. The report, however, raised a strong opposition from those interested in the oyster trade, fearing an injury to their business if not to the oyster itself. So strong was this feeling that the commission was requested to continue its investigations and recommend some system which would provide for the purification of the effluent. It was naturally assumed that agricultural filtration would be the alternative selected, but, as is well known, the past year has been remarkable for the development of several processes of bacterial purification of

sewage, including rapid filtration through specially prepared media, which it has seemed worth while to look into before reaching definite conclusions.

Among those of particular prominence just now are the septic tank treatment as in use at Exeter and Yeovil, England, and at Armagh, Ireland, and the Scott-Moncrieff process just installed at Caterham, England—both of which depend upon the action of anærobic bacteria; coke filtration, as employed by Dibdin at Sutton, England, and forced aeration, as introduced by Colonel Waring at Willow Grove Park, Pa., Homewood and Tuxedo Park, N. Y. The "International" or ferozone polarite process, too, is highly indorsed as a method of chemical precipitation, and a plant is just being installed for the city at Madison, Wis.

It remains to be seen whether one or more of these or other methods of purification may be availed of by Baltimore to advantage.

The problem of financing a piece of work such as this for Baltimore is of the utmost importance. The taxable basis of the city this year is but \$367,042,811, and most of this is assessed close to its full valuation at a rate of \$2.25 on the hundred. This, with the necessary expenses for public improvements, is already a burden to many, and the commission has therefore given considerable thought to the solution of the problem. The reported estimates for the filtration scheme were as follows:

For a population of 330,000:	
Interceptors and disposal	\$12,196,803
Laterals	2,032,500
Total construction	\$7,872,707
Maintenance, interest and renewals per annum....	423,277
For a population of 1,000,000:	
Interceptors and disposal	\$5,840,207
Laterals	5,280,000
Total construction	\$17,476,803
Maintenance, interest and renewals per annum....	966,844

In general, the plan recommended contemplates an issue of long-term bonds to provide for the construction of the interceptors, outfall mains, pumping plants and disposal works, while the network of laterals would be paid for by a direct assessment against abutting property. The annual charges, consisting of interest, sinking fund, maintenance and renewals, would be met by a system of rentals similar to that in use by the water department. Such a plan has just been adopted by the city of Boston for its sewerage work.

Based upon the estimates given in the report for the most costly project—that of agricultural filtration—this annual rental per house would probably average at first somewhere between \$5 and \$10, and this would diminish as time went on until, after the liquidation of the bonded debt and deducting the actual present cost of cleaning cess-pools, the extra expense due to the installation and operation of the proposed works would practically disappear.

POLICE DEPARTMENT STATISTICS.

The following statistical statements, compiled by the bureau of information of the League of American Municipalities, show the number of men, with rank or grade and salaries paid, in police departments of leading cities. The publication of these statistics, showing a number of additional cities, will be continued in the next number of CITY GOVERNMENT.

ALLEGHENY, PA.

1 Supt.,	\$2,000.00
1 Asst. Supt.,	1,400.00
6 Detectives,	7,200.00
1 Captain,	1,200.00
1 Captain,	1,000.00

8 Lieutenants, \$1,003.75 each,	8,030.00
6 Sergeants, \$912.50 each,	5,475.00
3 Operators, \$912.50 each,	2,737.50
1 Ordinance Officer,	912.50
82 Patrolmen, \$912.50 each,	74,825.00
18 Wagonmen, \$912.50 each,	16,425.00
2 Matrons, \$600 each,	1,200.00
1 Park Lieutenant,	821.25
4 Park Patrolmen, \$730 each,	2,920.00
1 Carnegie Hall Officer,	720.00
1 Market House Officer,	900.00
1 Police Surgeon,	500.00
1 Pound Master,	600.00
2 Dog Catchers, \$600 each,	1,200.00
1 Driver of Dog Wagon,	600.00

142 Total, \$130,665.25
 Population: Census, 1890, 105,287.
 Supt.: Henry Muth.

AUGUSTA, GA.

1 Chief,	\$1,500.00
2 Lieutenants, \$1,300 each,	2,600.00
1 Orderly Sergeant,	960.00
4 Mounted Sergeants, \$940 each,	3,760.00
4 Sergeants, \$840 each,	3,360.00
53 Patrolmen, \$720 each,	38,160.00
2 Detectives, \$840 each,	1,680.00
1 Janitor and Driver,	420.00
1 Driver,	360.00
1 Female Janitor,	120.00

70 Total, \$52,920.00

Area of city: 6 square miles.

Miles of streets: 80.

Population: Census of 1890, 33,300; estimated 1898, 46,000.

BRIDGEPORT, CONN.

1 Superintendent,	\$1,600.00
1 Captain,	1,200.00
1 Detective Sergeant,	1,200.00
3 Sergeants, \$1,043.10 each,	3,129.30
1 Lieutenant,	1,098.00
45 Patrolmen, \$959.95 each,	43,197.75
1 Retired Officer,	500.00
1 Janitor,	420.00
1 Matron,	549.00
1 Driver,	549.00

56 Total, \$53,443.05

[NOTE: Court officers, truant officers and dog and liquor officers are assigned from the regular patrolmen.]

Days off with pay: One each month.

Area of city: 13.4 square miles.

Miles of streets: 149½.

Population: Census, 1890, 48,866; estimated 1898, 65,000.

Supt.: Eugene Birmingham.

BINGHAMTON, N. Y.

1 Chief,	\$1,200.00
2 Asst. Chiefs, \$1,020 each,	2,040.00
1 Police Detective,	900.00
1 Roundsman,	900.00
29 Patrolmen, \$780 each,	22,620.00

34 Total, \$27,660.00

[NOTE: Patrolmen salaries range from \$60 to \$70 per month, according to length of time in service.]

Area of city: 10 square miles.

Population: Estimated 1898, 45,000.

Chief: C. H. Meade.

BALTIMORE, MD.

3 Commissioners, \$2,500 each,	\$7,500.00
1 Secretary,	2,000.00
1 Asst. Secretary,	1,200.00
1 Marshal,	2,500.00
1 Deputy Marshal,	2,000.00
3 Police Physicians, \$1,000 each,	3,000.00
1 Clerk to Marshal,	1,300.00
8 Captains, \$1,560 each,	12,480.00
16 Lieutenants, \$1,300 each,	20,800.00
15 Detectives, \$1,196 each,	17,940.00
14 Round Sergeants, \$1,196 each,	16,744.00
81 Squad Sergeants, \$1,040 each,	84,240.00
620 Policemen, \$936 each,	580,320.00
14 Turnkeys, \$936 each,	13,104.00
7 Station House Clerks, \$936 each,	6,552.00
50 Probation Officers, \$624 each,	31,200.00
14 Matrons, \$520 each,	7,280.00
5 Hostlers, \$546 each,	2,730.00
2 Engineers of Patrol Boat, \$936 each,	1,872.00
2 Firemen of Patrol Boat, \$780 each,	1,560.00
5 Janitresses, \$204 each,	1,020.00
1 Janitress,	300.00
1 Janitress,	336.00

866 Total, \$817,978.00

Days off with pay: 15 days per year.

Area of city: 32 square miles.

Miles of streets: 514 38-100.

Population: Census of 1890, 455,427; estimated 1898, 510,000.

Chief: S. T. Hamilton.

PENSION ROLL.

There are 79 pensioners, and the total pension roll for the year amounts to \$26,121.36.

CAMBRIDGE, MASS.

1 Chief,	\$1,800.00
1 Deputy Chief,	1,500.00
3 Captains, \$1,400 each,	4,200.00
1 Inspector,	1,400.00
1 Asst. Inspector,	1,200.00
7 Sergeants, \$1,186.25 each,	8,303.75
80 Patrolmen, \$1,042.86 each,	83,428.80
5 Patrolmen, \$912.50 each,	4,562.50
5 Reserve Patrolmen, \$730 each,	3,650.00
2 Matrons, \$365 each,	730.00
2 Drivers, \$860.40 each,	1,720.80
4 Drivers, \$782.35 each,	3,129.40

112 Total, \$115,625.25

Days off with pay: 14 each year.

Area of city: 6.75 square miles.

Miles of streets: 100.

Population: Estimated 1898, 88,000.

Chief: L. J. Cloyes.

CHARLESTON, S. C.

1 Chief,	\$1,800.00
1 First Lieutenant,	1,200.00
1 Second Lieutenant,	1,080.00
1 Third Lieutenant,	1,080.00
2 Sergeants, \$720 each,	1,440.00
8 Sergeants, \$660 each,	5,280.00
1 Chief of Detectives,	900.00
3 Detectives, \$660 each,	1,980.00
73 Privates, \$600 each,	43,800.00
4 Gatemen, \$480 each,	1,920.00
2 Daymen, \$360 each,	720.00

(Continued on Page 231.)

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SPECIAL NOTICE.

City officials and friends of City Government visiting New York are cordially invited to make the office of City Government their headquarters during their stay in the city. Desks, stenographers and stationery are placed at their disposal, and their mail may be addressed in our care.

NOTE AND COMMENT.

**The
Goo Goo
Convention.**

The municipal reformers have been in session in Indianapolis. Preachers, professors and others of the truly good gentry to the number of thirty or forty were present. It was "a national conference for good city government," and at the outset the conferrees took the position that every municipality in the United States was suffering more or less from inefficient and corrupt government. It was an easy matter for these gentlemen—most of whom were unencumbered with knowledge of municipal conditions—to point out the road to salvation. The one thing needful to save our municipalities, according to the views expressed at the conference, is a change of charters. The government in one city is bad because the charter centralized powers and responsibilities in the mayor's office, the government in another city is bad because the charter does not centralize powers and responsibilities in the mayor's office. Both of these arguments were presented and positively proved, and the wisdom of the conferrees suggested the simple remedy of swapping charters. It is all over now. The Indianapolis conference, knowing the evil, found the remedy. So, if your city engineer knows more about planning a political campaign than a sewerage system, get a new charter. If the majority of your aldermen are bribe-takers and black-mailers, get a new charter. If your mayor exercises his powers without discretion or honesty, get a new charter. If your fire chief prefers reading detective stories to studying the art of fire protection, get a new charter. We all know the possibility of legislating honesty and knowledge into the human being. Seriously speaking, the municipal reformers will accomplish but little good so long as they devote all their attention to forms of government. Very little depends upon the form, while very much depends upon the judgment of the people in selecting their public servants. City government is business. If the president, general manager or train dispatcher of a railroad is found to be dishonest or incompetent, the

company does not change its form of management, but rather changes the personnel of its staff of servants. The honest and competent man holds his position in the railroad business as long as he wants it—he advances or retires as he elects. How about the honest and competent city official? He must be a shrewd and active politician to hold his position beyond a term or two.

**Fire
In High
Buildings.**

Architects, builders, underwriters and firemen are afforded an extremely practical lesson by the fire that destroyed the upper eight stories of the sixteen-story Home Life Insurance Building, New York, on the night of December 4. The architects and builders who planned the building and considered it absolutely fire-proof were doubtless surprised to see the flames eat through it with the rapidity of a prairie fire. It was demonstrated that so-called fire-proof construction is in no degree exempt from the ravages of the fire fiend when it is so far from terra firma that firemen have great difficulty in reaching it with their hose lines. Chief Bonner, than whom there is no abler fire fighter, says: "This fire proves what has been contended all along in the case of sky scrapers, and that is that a fire on the top floors would have almost free play. The effective and rapid working limit of the fire department in this city is not more than 150 feet in altitude. Up to that height men can rush their hose and begin fighting before the flames have gained any headway. In this case, where we had to take a line of hose up more than two hundred feet, the work was necessarily so slow that the fire had gained good headway before we could turn a stream. The hose had to be slowly hauled up on the outside of the building by ropes. This, of course, took time. Then, too, with hose reaching to that height, with a pressure of 200 pounds to the inch, care had to be taken that the force of the water did not burst it. We think we have done well considering the disadvantage under which we labored. Something will have to be devised to overcome these difficulties in the future."

**His
Tongue
Ran Wild.**

The reputation of municipal reformers for misrepresentation and careless speech was fittingly sustained by a party by the name of Swift at the Indianapolis good government conference. Swift, we understand, lives in Indianapolis and devotes much of his time to criticizing citizens whose opinions and actions are too broad and deep for his narrow conception. His tongue was one of the chief exhibits at the Goo Goo convention, and it was operated to vilify his own city. Swift said, in substance, that the present municipal administration at Indianapolis is extravagant and insufficient, despite the fact that nearly everybody in that city and a great many persons outside of it know that Mayor Thomas Taggart and his official associates are giving to their city the most intelligent and economical administration it has ever had. The Indianapolis *Sentinel* pays its respects to Swift like this:

Mr. Lucius B. Swift's performance before the Municipal Reform League on Friday was eminently characteristic and wholly discreditable—or would have been to any other citizen making pretensions to dignity and responsibility. His attack upon the city administration was not only in the worst possible taste—it was both malignant and mendacious. It was a wanton and deliberate misrepresentation of the conditions existing in this city, and its only effect, if it had any at all, was to create a false impression, and one most injurious to Indianapolis, upon the minds of the well-entertained people who heard him and among those who read the printed reports of his remarks. * * * That a citizen of Indianapolis should deliberately arise before a

body of gentlemen enjoying the hospitalities of that city and repeat cheap and exploded partisan slanders against it is simply disgraceful. What Mr. Swift alleged against the administration was mostly false, and to the extent that it was not false it was unimportant. The fact is that Indianapolis has one of the best charters in existence, and is one of the best governed cities in the world. * * * Mayor Taggart is not a professional reformer. He is an active politician, as every mayor of Indianapolis has been and will be for a long time to come. He does not go about posing as the only good and honest man in the town. He is not in the habit of denouncing as thieves and rascals those who differ from him, politically or otherwise. He is a practical and a reasonable man. But it is safe to say that he has done more to make Indianapolis a good city to live in—to improve her financial and sanitary condition—to give the city reputation and standing abroad—than a thousand narrow-minded and intolerant fellows of the type of Swift could do in a hundred years. One citizen like Thomas Taggart is of more value to Indianapolis than an army of Lucius Blatherskite Swifts. This is not to say that Mr. Taggart is infallible, or that he moves on a higher plane than the rest of us. But it is to say that he is a man of remarkable executive ability, of rare common sense, of tireless industry, with a keen interest in the welfare and good name of the city in which he lives, and, measured by any proper standard of manhood and good citizenship, is infinitely the superior of the poor creature who abuses the opportunity afforded by the presence of a body of strangers in the city to traduce and insult him and the splendid city of which he is the honored chief executive.

POLICE DEPARTMENT STATISTICS.

(Continued from Page 229.)

5 Drivers, \$360 each,	1,800.00
5 Officers Horse Feed, \$156 each,	780.00
107 Total,	\$63,780.00

[NOTE: There are also three detectives paid \$600 each per year, out of a special fund, to work up cases for the Sessions Court.]

Area of city: 3 square miles.

Miles of streets: 60.

Population: Estimated 1898, 63,000.

Chief: W. A. Boyle.

CHICAGO, ILL.

1 Gen'l. Supt.,	\$6,000.00
1 Private Sec'y.,	1,800.00
1 Asst. Supt.,	4,000.00
1 Sec'y of Dept.,	2,250.00
4 Inspectors, \$2,520 each,	10,080.00
3 Clerks Sec'y's Office, \$1,100 each,	3,300.00
1 Chief Clerk Det. Bureau,	1,500.00
1 Day Clerk,	1,000.00
1 Night Clerk,	1,000.00
1 Supt. Bu. Identification,	1,500.00
1 Photographer,	1,200.00
1 Asst. Photographer,	1,000.00
3 Stenographers, \$900 each,	2,700.00
1 Printer,	1,200.00
1 Asst. Printer,	1,000.00
1 Pressman,	720.00
1 Veterinary Surgeon,	1,500.00
2 Asst. Vet. Surgeons, \$1,000 each,	2,000.00
16 Captains, \$2,250 each,	36,000.00
58 Lieutenants, \$1,500 each,	87,000.00
2 Lieutenants Det. Dept., \$1,700 each,	3,400.00
2 Sergeants, \$1,500 each,	3,000.00
109 Patrol Sergeants, \$1,200 each,	130,800.00
40 Detective Sergeants, \$1,200 each,	48,000.00
102 Desk Sergeants, \$1,200 each,	122,400.00
23 Haymarket Pensioners, \$500 each,	11,500.00
380 First-class Patrolmen, \$1,000 each,	380,000.00

175 Patrolmen for Wagons, \$1,000 each,	175,000.00
2,445 Patrolmen, \$1,000 each,	245,000.00
1 Custodian,	1,400.00
4 Vehicle Inspectors, \$1,200 each,	4,800.00
1 Chief Tel. Operator,	1,400.00
1 Asst. Tel. Operator,	1,200.00
125 Telegraph Operators, \$720 each,	90,000.00
95 Patrol Drivers, \$720 each,	66,960.00
6 Supply Wagon Drivers, \$720 each,	4,320.00
8 Ambulance Drivers, \$720 each,	5,760.00
10 Engineers, \$1,000 each,	10,000.00
9 Asst. Engineers for eight mos., \$550 each,	4,950.00
35 Janitors, \$530 each,	18,550.00
15 Hostlers, \$630 each,	9,450.00
1 Chief Matron,	900.00
30 Matrons, \$720 each,	21,600.00
1 Foreman Repair Shop,	1,200.00
4 Printers for Shop, \$900 each,	3,600.00
2 Wagonmakers, \$900 each,	1,800.00
7 Carpenters, \$900 each,	6,300.00
3 Blacksmiths, \$1,000 each,	3,000.00
3 Blacksmith's Helpers, \$720 each,	2,160.00
2 Saddler and Harness Makers, \$900 each,	1,800.00
1 Plumber,	1,000.00
1 Plumber,	900.00
1 Foreman Construction Dept.,	1,200.00
6 Painters and Kalsominers, \$900 each,	5,400.00
15 Laborers, \$630 each,	9,450.00
1 Plasterer,	900.00
1 Feed Inspector,	1,200.00
18 Scrub Women,	4,080.00

3,785 Total, \$3,771,130.00

Area of city: 193 square miles.

Population: 1,850,000.

Chief: Joseph Kipley.

CLEVELAND, OHIO.

1 Superintendent,	\$3,500.00
1 Deputy Supt.,	2,000.00
5 Captains, \$1,500 each,	7,500.00
1 Captain of Detectives,	1,500.00
24 Lieutenants, \$1,200 each,	28,800.00
17 Sergeants, \$1,100 each,	18,700.00
9 Detectives, \$1,200 each,	10,800.00
190 Patrolmen, \$1,000 each,	190,000.00
11 Patrolmen, \$960 each,	10,560.00
37 Patrolmen, \$900 each,	33,300.00
49 Patrolmen, \$840 each,	41,160.00
8 Patrolmen, \$780 each,	6,240.00
1 Secretary,	1,800.00
1 Surgeon,	1,300.00
1 Operator,	1,000.00
1 Lineman,	600.00
4 Matrons, \$666.66 each,	2,666.64
2 Janitors, \$780 each,	1,560.00
1 Janitor,	660.00
3 Asst. Janitors, \$600 each,	1,800.00
2 Firemen, \$720 each,	1,440.00
8 Female Janitors, \$216 each,	1,728.00
1 Female Janitor,	360.00
2 Hostlers, \$600 each,	1,200.00
1 Court Messenger,	300.00

381 Total, \$370,474.64
Days off with pay: Each officer gets one day each month.

Area of city: 32 square miles.

Miles of streets: 562.

Population: Estimated 1898, 392,448.

Supt.: Geo. E. Corner.

PENSION ROLL.

There are 42 pensioners, and the annual pension roll amounts to \$27,220.

DENVER, COL.

1 Chief,	\$2,500.00
2 Captains, \$1,500 each,	3,000.00
1 Chief of Detectives,	1,200.00
3 Sergeants, \$1,020 each,	3,060.00
2 Sergeants, \$960 each,	1,920.00
8 Detectives, \$1,080 each,	8,640.00
1 Secretary,	1,140.00
2 Clerks, \$1,020 each,	2,040.00
1 Day Jailer,	1,080.00
1 Night Jailer,	960.00
2 Surgeons, \$1,200 each,	2,400.00
2 Ambulance Drivers, \$1,020 each,	2,040.00
2 Matrons, \$900 each,	1,800.00
1 Bailiff,	960.00
2 Herders, \$1,020 each,	2,040.00
2 Hostlers, \$720 each,	1,440.00
1 Lineman,	1,020.00
3 Operators, \$720 each,	2,160.00
67 Officers, \$960 each,	64,320.00
5 Officers, \$900 each,	4,500.00
1 Janitor,	600.00
Total,	\$108,820.00

Area of city: 55 square miles.

Miles of streets: 820.

Population: 165,000.

Chief: J. F. Farley.

DES MOINES, IA.

1 Chief,	\$1,200.00
1 Asst. Chief,	900.00
1 Captain,	900.00
2 Sergeants, \$780 each,	1,560.00
2 Desk Sergeants, \$720 each,	1,440.00
22 Patrolmen, \$720 each,	15,840.00
7 Patrolmen, \$600 each,	4,200.00
2 Drivers, \$600 each,	1,200.00
2 Mounted Police, \$720 each,	1,440.00
1 Matron,	720.00
1 Chief Detective,	900.00
4 Detectives, \$840 each,	3,360.00
3 Health Officers, \$660 each,	1,980.00
1 Depot Matron,	720.00
1 Janitor,	720.00
1 Janitor,	540.00
Total,	\$37,620.00

Area of city: 54 square miles.

Population: Estimated 1898, 75,000.

Chief: Fred. Johnson.

DAYTON, OHIO.

1 Supt.,	\$2,000.00
1 Secretary,	1,000.00
1 Stenographer,	420.00
1 Captain,	1,000.00
1 Sergeant of Detectives,	880.00
4 Sergeants, \$880 each,	3,520.00
1 Detective,	720.00
54 Patrolmen, \$720 each,	38,880.00
1 Substitute Patrolman,	660.00
2 Ambulance Men, \$600 each,	1,200.00
3 Drivers, \$600 each,	1,800.00
1 Electrician,	720.00
1 Janitor,	300.00
1 Matron,	480.00
Total,	\$53,580.00

Area of city: 12 square miles.

Population: Estimated 1898, 85,000.
Supt.: T. J. Farrell.

DULUTH, MINN.

1 Chief of Police,	\$1,500.00
1 Captain of Police,	1,080.00
1 Lieutenant,	960.00
2 Detectives, \$900 each,	1,800.00
3 Sergeants, \$840 each,	2,520.00
1 Secretary,	840.00
2 Court Officers, \$900 each,	1,800.00
2 Drivers, \$780 each,	1,560.00
2 Tailors, \$720 each,	1,440.00
2 Telephone Operators, \$720 each,	1,440.00
28 Patrolmen, \$780 each,	21,840.00
Total,	\$36,780.00

Area of city: 67.25 square miles.

Miles of streets: 220.

Population: Census 1895, 59,396; estimated 1898, 60,000.

Chief: Iwan Hansen.

DALLAS, TEX.

1 Chief Police,	\$1,800.00
1 Asst. Chief,	1,020.00
1 Night Captain,	960.00
1 Chief Detective,	900.00
3 Detectives, \$900 each,	2,700.00
1 Clerk,	720.00
8 Mounted Patrolmen, \$900 each,	5,400.00
22 Patrolmen, \$720 each,	15,540.00
2 Drivers, \$600 each,	1,200.00
2 Station Keepers, \$720 each,	1,440.00
1 Night Watchman,	240.00
1 Pound Keeper,	720.00
1 Guard of Prisoners,	648.00
Total,	\$33,588.00

Days off with pay: 1 each month.

Area of city: 9.25 square miles.

Miles of streets: 139.

Population: 60,000.

Chief: G. E. Cornwell.

FORT WAYNE, IND.

1 Superintendent,	\$1,200.00
1 Captain,	900.00
1 Lieutenant,	840.00
2 Sergeants, \$800 each,	1,600.00
1 Detective,	720.00
1 Station Master,	720.00
1 Humane Officer,	420.00
1 Electrician,	420.00
2 Clerks, \$480 each,	960.00
2 Drivers, \$600 each,	1,200.00
27 Patrolmen, \$720 each,	19,440.00
Total,	\$28,420.00

[NOTE: The Humane Officer receives \$5.00 per month additional from the Humane Society, and the Electrician receives \$15 per month additional from the Fire Department.]

Days off with pay: 2 weeks each year.

Area of city: 5 square miles.

Population: Census of 1890, 35,393; estimated 1898, 50,000.

Supt.: H. A. Gorsline.

FALL RIVER, MASS.

1 City Marshal,	\$1,800.00
1 Asst. City Marshal,	1,300.00
4 Captains, \$1,100.00 each,	4,400.00
4 Inspectors, \$1,003.75 each,	4,015.00
6 Lieutenants, \$1,003.75 each,	6,022.50
1 Clerk of City Marshal,	1,003.75

94	Patrolmen, \$912.50 each,	85,775.00
3	Patrolmen, \$730 each,	2,190.00
1	Electrician,	400.00
2	Stewards, \$912.50 each,	1,825.00
6	Stewards, \$766.50 each,	4,599.00
2	Matrons, \$500 each,	1,000.00
1	Court Janitor,	730.00

125 Total, \$114,660.25

Days off with pay: 14 each year.

Area of city: 41 square miles.

Miles of streets: 126.

Population: Census, 1890, 74,832; estimated 1898, 102,000.

City Marshal: Rufus B. Hilliard.

GRAND RAPIDS, MICH.

1	Supt.,	\$2,300.00
1	Captain,	1,195.00
1	Lieutenant,	1,158.00
1	Supt. Fire Alarm,	350.00
3	Sergeants, \$1,000 each,	3,000.00
6	Detectives, \$1,000 each,	6,000.00
2	Clerks, \$702.63 each,	1,405.25
3	Operators, \$390 each,	1,170.00
2	Janitors, \$684.38 each,	1,368.75
1	Asst. Pound Master,	420.00
1	Matron,	600.00
73	Men, \$748.25 each,	54,622.25
7	Men, \$713.95 each,	4,997.65
7	Men, \$680.10 each,	4,760.70
6	Men, \$657 each,	3,942.00
1	Stenographer,	360.00

116 Total, \$87,649.60

Days off with pay: 6 per year.

Area of city: 17.75 square miles.

Miles of streets: 283.

Population: Estimated 1898, 100,000.

Supt.: Harvey O. Carr.

INDIANAPOLIS, IND.

1	Superintendent,	\$2,000.00
2	Captains, \$1,080 each,	2,160.00
1	Chief of Detectives,	1,140.00
8	Sergeants, \$900 each,	7,200.00
10	Detectives, \$900 each,	9,000.00
130	Patrolmen, \$810 each,	105,300.00
2	Drivers, \$810 each,	1,620.00
1	Surgeon,	900.00
1	Clerk,	900.00
1	Electrician,	810.00
3	Janitors, \$600 each,	1,800.00
2	Matrons, \$600 each,	1,200.00
1	Custodian,	810.00
6	Bicycle Patrolmen, \$810 each,	4,860.00

169 Total, \$139,700.00

Days off with pay: none.

Area of city: 26 square miles.

Miles of streets: 200.

Population: Census, 1890, 125,000; estimated 1898, 190,000.

Supt.: Jas. F. Quigley.

KANSAS CITY, MO.

2	Commissioners, \$500 each,	\$1,000.00
1	Secretary,	1,500.00
1	Chief of Police,	3,000.00
1	Secretary to Chief,	1,200.00
1	Inspector of Detectives,	1,800.00
1	Surgeon,	1,500.00
4	Captains, \$1,080 each,	4,320.00
4	Lieutenants, \$960 each,	3,840.00

10	Detectives, \$960 each,	9,600.00
1	Court Sergeant,	1,020.00
10	Sergeants, \$900 each,	9,000.00
111	Patrolmen, \$840 each,	93,240.00
31	Probationary Patrolmen, \$720 each,	22,320.00
1	Chief Operator,	720.00
5	Operators, \$600 each,	3,000.00
1	Matron,	600.00
1	Humane Officer,	540.00
10	Turnkeys, \$600 each,	6,000.00
2	Drivers, \$660 each,	1,320.00
1	Hostler,	540.00

199 Total, \$166,060.00

Area of city: 26 square miles.

Miles of streets: 600.

Population: Estimated 1898, 185,000.

MILWAUKEE, WIS.

1	Chief of Police,	\$3,600.00
1	Inspector,	2,100.00
1	Captain,	1,700.00
4	Lieutenants, \$1,400 each,	5,600.00
10	Detectives, \$1,400 each,	14,000.00
4	Sergeants, \$1,200 each,	4,800.00
8	Roundsmen, \$1,020 each,	8,160.00
275	Patrolmen, \$960 each,	264,000.00
1	Secretary,	1,200.00
1	Clerk,	720.00
1	Supt. Police Alarm,	1,600.00
1	Batteryman,	1,100.00
2	Linemen, \$840 each,	1,680.00
1	Chief Operator,	1,000.00
5	Operators, \$800 each,	4,000.00
1	Janitor,	800.00
1	Janitor,	720.00
1	Janitor,	600.00
1	Matron,	300.00

320 Total, \$317,680.00

Days off with pay: 10 days' vacation each year.

Area of city: 23 square miles.

Miles of streets: 500.

Population: 1890, 204,468; estimated 1898, 285,000.

Chief: J. T. Jansson.

MINNEAPOLIS, MINN.

1	Superintendent,	\$3,000.00
5	Captains, \$1,200 each,	6,000.00
9	Detectives, \$1,200 each,	10,800.00
15	Sergeants, \$1,000 each,	15,000.00
2	Mounted Sergeants, \$1,260 each,	2,520.00
16	Mounted Men, \$1,160.04 each,	18,560.64
4	Lieutenants, \$1,100.04 each,	4,400.16
1	Mounted Lieut.,	1,360.08
1	Jailor,	1,160.04
3	Telegraph Operators, \$900 each,	2,700.00
1	Chief's Secretary,	1,500.00
1	Police Clerk,	1,600.00
1	Stenographer,	600.00
6	Jailors, \$900 each,	5,400.00
6	Drivers, \$900 each,	5,400.00
2	Janitors, \$720 each,	1,440.00
1	Janitress,	250.00
1	Police Matron,	720.00
5	Municipal Court Officers, \$1,000 each,	5,000.00
134	Patrolmen, \$900 each,	120,600.00

215 Total, \$208,010.92

Days off with pay: 13 a year.

Area of city: 53.29 square miles.

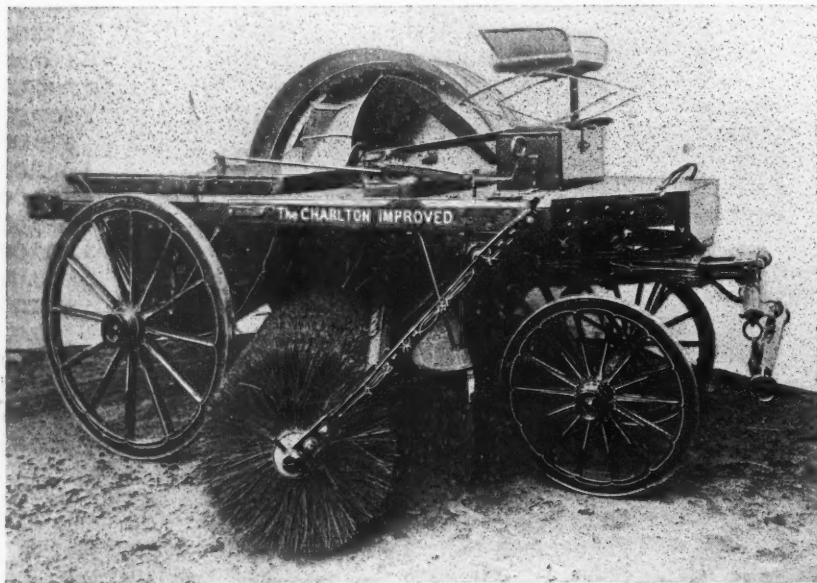
Miles of streets: 789.

Population: 210,000.

MUNICIPAL CONTRACT DEPARTMENT

PICK-UP STREET SWEEPER.

The Charlton street sweeper is a new machine that is bound to find favor with contractors and officials having in charge the cleaning of streets. One of the chief virtues of the Charlton is its simplicity, as will be observed from the accompanying illustration. Its mechanical operation is so simple and complete that any good driver can operate it without difficulty. It is light of draught, compact and easily managed. The use of the Charlton sweeper lessens public discomfort, as the dirt is confined to the machine and not allowed to lie in the street and be scattered by the wind. "It takes the dirt with it" and



THE CHARLTON PICK-UP SWEEPER.

therefore does the work for which, in ordinary side sweeping, a force of men is indispensable. Aside from doing its work perfectly and without annoyance to the public, the Charlton is a money-saver, which, after all, is a most important consideration for contractors and city officials. This new machine is the product of the Charlton Manufacturing Company, 154 Reade street, New York. The company has under construction a hand sweeper that can be easily operated by one man, and will be adapted to light sweeping and a splendid adjunct to the large machines for picking up droppings, etc.

FILTER BIDS AT ALBANY.

The water filtration beds at Albany, N. Y., being built by T. Henry Dumary and Wilson & Baillie, are nearing completion. The plant consists of an old low-lift pumping station, drawing water from the Hudson River; a sedimentation basin, with a capacity of sixteen million gallons; eight covered filter beds, with a combined capacity of fifteen million gallons, and a six hundred thousand gallon covered pure water basin. The bottom of the sedimentation basin is composed of sixteen inches of puddle, then two feet of broken stone and then ten inches of stone

paving. The floors and roofs of the filter beds and clear water basin are of concrete, and the walls of the filter compartments and the piers of the compartments are of brick.

FLUSHING ASPHALT STREETS.

The city of St. Paul has finished its first season of flushing asphalt streets. The work was done by the city, under the supervision of City Engineer Rundlett, and has given perfect satisfaction. Prior to the introduction of flushing, merchants complained that the fine dust from the asphalt streets blew into their stores and damaged goods, and the health authorities thought the dust in the air was injurious to the public health. The total cost of flushing the streets 230 days was \$3,280, of which sum \$2,500 was for the hire of laborers and \$780 was for water rent that reverts back to the city as a part of the earnings of the city water department.

The flushing crew got out at 8 o'clock in the evening and washed about two miles of street every night, the work being done at night so that travel on the streets would not interfere. The total number of miles of streets flushed during the season was about 350. The cost at the beginning, when the work was not systematized as well, was at the rate of \$10 a mile, but was reduced toward the middle of the season to \$9 a mile. All the streets were flushed three times a week.

Sections of ordinary fire hose, mounted on little trucks with wheels four inches in diameter, were connected, until they were just a block long. The hose was drawn to the hydrant on the corner at which the crew desired to commence work, where it was attached and the crew started in. Two men held the nozzle and two more a few feet back assisted in holding up the hose and in directing the stream. Strung along the length of the hose were other men who pushed and pulled the hose along with hooks about six feet in length. Another man attended to turning on and off the water at the hydrants.

PAVING ORDINANCES INVALID.

A recent decision of the County Court has invalidated all of the pending ordinances for brick paving in Chicago. The Court held that the provision of the ordinance requiring the pavement to meet "a test satisfactory to the Board of Local Improvements" gave the board too much discretionary power.

COST OF PAVING AND CLEANING.

The board of public works of Detroit, Mich., have prepared a statement showing the comparative prices of paving and street cleaning in that city in 1889 and 1898. In 1889 cedar on plank cost \$1.23 and asphalt cost \$2.66 a square yard, and in 1898 cedar on concrete cost \$1.29 and asphalt \$1.80. With cedar on plank principally used

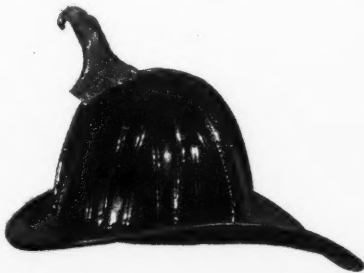
for paving in 1889 it cost the city \$55,990 to clean 133 miles of paved streets, while in 1898 it cost the city \$68,660 for cleaning 248 miles of paved streets.

SPECIAL ASSESSMENT DECISION.

In the case of L. W. Smith and others against the city of Des Moines, the Iowa Supreme Court decides that under the constitution of Iowa, when a tract of land has been platted into lots, the platted boundary line must control in determining paving assessments; that any assessment must be limited to the lot or parcel of ground which abuts on the paved street, however small, without regard to the use made of it, and no subdivision which does not actually abut on the street improved can rightfully be assessed for the improvement.

DOLFINI'S NEW FIRE HAT.

Fire service hats are worn for the sole purpose of protecting firemen from falling water and debris. It is an easy matter to make a hat that will properly throw off water—as this simple function is performed by the usual



broad and sloping brim. But to make a hat that will thoroughly protect the fire-fighter's head from falling brick, stone, mortar, timber or other heavy materials is a task fitted to the best inventive skill. A. W. Dolfini & Co. have just placed

on the market a leather hat that certainly meets all the requirements. It is made with a double thickness of leather in the crown, this double thickness being carried out in eight cones strong enough and tough enough to resist any possible pressure or velocity that may be brought against them. Although the crown is double, the leather is so prepared that the hat is only a trifle heavier than the old-style single-crown leather hat.

The other day Mr. Dolfini gave the hat a peculiar test in the CITY GOVERNMENT office. Not having any apparatus at hand to apply a pressure test, it was jocularly suggested that the hat be placed under the two-ton iron safe in the office. Mr. Dolfini readily assented to this test. Four strong men lifted one side of the safe sufficiently to place the crown of the hat underneath it; then the safe was lowered onto the top of the hat. Everybody present was astonished to see that the hat sustained the load—holding the rollers on one side of the safe three-quarters of an inch above the floor. Again the safe was lifted and let down on one of the old-style single-crown leather hats, which it crushed completely. The test was witnessed by half a dozen gentlemen.

CONTRACT ITEMS.

WATERWORKS.

- The water mains at Goshen, Ind., will soon be extended.
- The water mains at Sioux City, Iowa, will soon be enlarged and extended.
- The water mains at Bonham, Tex., are to be extended at a cost of \$5,000.
- The construction of a waterworks system at Canonsburg, Pa., is contemplated.
- The city of Boston, Mass., will issue a loan of \$200,000 to extend the water system.

—The question of building a waterworks system is under consideration at Granville, Mass.

—The citizens of Oregon, Wis., have voted to issue bonds for the construction of a water plant.

—A committee has been appointed at Carey, Ill., to investigate the question of bonding the city for waterworks.

—The superintendent of the waterworks at Newport, Ky., has recommended extensions estimated to cost \$15,000.

—A new waterworks system is to be built at Osage, Ia. City Engineer Meredith, of Cedar Rapids, Ia., has made the plans.

—A new waterworks system will soon be built at Camby, Minn. M. B. Haynes, of Mankato, Minn., is making the plans.

—The city of Rome, N. Y., will petition the Legislature for authority to issue bonds to establish a gravity system of waterworks.

—Bids will be soon asked on the construction of a water system at Shawnee, O. Ter. Owen Ford, 710 Security Building, St. Louis, is preparing the plans.

—Chief Hale, of the Kansas City, Mo., fire department, recommends the establishment of a system of fire cisterns or the installation of a high pressure water service for fire protection.

—Bids for the construction of the new water system at Gaffney, S. C., will be opened on January 3. The plans have been prepared by Frederick Minshall, of Pocomoke City, Md.

—The council of Little Falls, Minn., has passed a resolution authorizing the water and light committee to procure plans and specifications for a water and light plant. The committee will report on December 17.

—The board of waterworks trustees of Youngstown, Ohio, have taken the initial steps toward securing an improved waterworks system. It is roughly estimated that the contemplated change will cost the city about \$300,000, and a proposition to issue bonds for the amount will be submitted to the voters at the spring election.

STREET WORK.

—Fifteen blocks of brick pavement are soon to be laid at Oskaloosa, Iowa.

—A complete system of sewerage is contemplated at Lake Linden, Mich.

—The city of El Paso, Tex., will issue \$21,000 of bonds for street improvements.

—Bids will be received until January 2 on the construction of storm sewers at Hamilton, Ohio.

—The council of Montgomery, Ala., has decided to issue \$20,000 of bonds for street improvements.

—The board of public works of Quincy, Ill., has mapped out about eight miles of paving for next season.

—The citizens of Columbus, Ohio, will at the spring election vote on the question of issuing bonds for a sewage disposal system.

—The board of estimates at St. Louis, Mo., recommends appropriations amounting to \$630,000 for sewer work during the coming year.

—The city of St. Peter, Minn., will put in a complete sewerage system. M. B. Hannes, Mankato, Minn., has been engaged to prepare the plans.

—The authorities at East Liverpool, Ohio, will soon call for bids on pipe sewers for sewer district No. 2. Eight miles of sewers will be required.

—Sealed proposals will be received until January 3 for constructing sewers and drains in Bassett Road, Cincinnati, Ohio. George H. Spellmire, clerk.

—Plans have been submitted to the board of public works of Louisville, Ky., for a new main sewer to cost about \$200,000. The board of works hopes to advertise for bids on the work shortly.

—The improvement board at Peoria, Ill., has just adopted estimates for the paving of over 17,000 square yards of street with asphalt and about 10,000 square yards with brick. Other estimates for brick paving are pending.

—The village of East Cleveland, Ohio, will open bids on December 30 for the construction of a number of sewers with appurtenances. Plans may be seen at the office of the village clerk or at the office of the Walter P. Rice Engineering Company, Society of Savings Bank Building, Cleveland.

ELECTRIC PLANTS.

—B. D. Blagden contemplates the erection of an electric light plant at Everett, Mass.

—The establishment of a municipal electric lighting plant is contemplated at Fonda, Ia.

—Woodsville, Ohio, will open bids for the erection of an electric light plant December 27.

—Carthage, Mo., has voted to issue \$25,000 of bonds to build a municipal electric light plant.

—Wellington, Kan., proposes to issue bonds for the purpose of erecting an electric light plant.

—On January 1 the city of Pasadena, Cal., will open bids for the erection of a municipal electric light plant.

—The city of Winnipeg, Man., contemplates the erection of a municipal electric lighting plant to cost \$50,000.

—The city council of Centralia, Ill., will soon call for bids on the construction of a municipal electric light plant.

—The question of establishing a municipal lighting plant at Charlotte, Mich., will soon be submitted to voters.

—An election will be held at Ellwood, Pa., December 20, for the purpose of deciding upon a municipal electric light plant.

—The sum of \$11,600 has been appropriated by the city council of Fredericksburg, Va., for the construction of a municipal electric system.

—The city council of Columbus, Wis., contemplates the construction of an electric light plant, to be operated in connection with the waterworks.

—An ordinance has been passed by the council of Hagerstown, Md., providing for the establishment of a municipal electric light and power plant.

—The Citizens' Electric Light and Water Company has been organized to establish an electric light plant at Smithfield, Va. J. W. Halloway is interested.

—H. B. Speechter, of Louisiana, Mo., has applied to the council of Independence, Mo., for an electric light franchise. He contemplates the erection of a \$30,000 plant.

FIRE APPARATUS.

—Seven new combination and chemical hose wagons are to be purchased by the fire board of Los Angeles, Cal.

—The board of fire commissioners of St. Paul, Minn., will build an additional engine house in the Midway district.

—Chief Engineer Kendall, of the Detroit, Mich., fire department, is of the opinion that his city needs a new fire boat.

—A new engine house is to be erected by the fire department of Pittsburg, Pa., at the corner of Filbert and Elmer streets.

—A volunteer fire department is being organized at Cromwell, Conn., and money will soon be appropriated for the erection of a fire house and the purchase of equipments.

—Chief Engineer Carroll, of the Memphis, Tenn., fire department, recommends that in the municipal budget for next year provision be made for the purchase of five new steam engines, two trucks and a chemical.

WATER PURIFICATION AT LOUISVILLE.

The extended, scientific and costly investigations into the purification of the Ohio River at Louisville, Ky., made by George W. Fuller for the Louisville Water Company, have been completed. Mr. Fuller's report, which is very complete and covers every possible question, has just been published in book form, under the title "Water Purification at Louisville," by the D. Van Nostrand Company, New York. The book comprises 480 quarto pages, with 8 full page plates, bound in cloth, and it is undoubtedly the most comprehensive work of the kind ever published. The details of the report are so numerous and bear so directly upon the general conclusions that it is impossible to make a condensed abstract or review of the work. It is fortunate, therefore, that Mr. Fuller's report appears in published form, so that it can be utilized for the benefit of communities other than Louisville. The introduction of the work shows the location, scope and principal dates of the investigations and the nature of the systems of purification tested. Then follow sixteen chapters, treating, in the order named, the following divisions of the work: Composition of the Ohio River water; description of the application of chemicals to the Ohio River water by the several systems of purification; decomposition and subsequent disposal of the alum or sulphate of alumina applied to the Ohio River water; coagulation and sedimentation of Ohio River water by aluminum hydrate formed by the decomposition of the applied alum or sulphate of alumina; description of the filters through which the river water passed after coagulation by aluminum hydrate and partial purification by sedimentation; summary of the various parts of the respective systems and a record of the repairs, changes and delays; the manner of operation of the respective systems of purification and the amount of attention given thereto; composition of the Ohio River water after treatment by the respective systems of purification as shown by chemical, microscopical and bacterial analysis, together with a tabulation of the most important data on the operation of the respective systems; summary of the principal data upon the efficiency and elements of the cost of purification by the respective systems, divided into twenty periods, according to the character of the unpurified water; description of the Harris-Magneto-Electric system of purification and a record of the results accomplished therewith; description of the devices operated by the Harris Company in July, 1896, and a record of the results accomplished therewith; investigations of the water company into the practicability and economy of the devices operated by the Harris Company; description of the Mark & Brownell Electrolytic devices and a record of the results accomplished therewith; description of the MacDougall Polarite system and a record of the results accomplished therewith; description of the methods and devices tested during 1897, and a record and discussion of the results accomplished therewith; final summary and conclusions. Among the full page illustrations are the plans and sections of the Warren, Jewell and Western mechanical filters.

MUNICIPAL LIBERTY.

Address by Professor Frank Parsons Before the Convention of the League of American Municipalities.

Liberty implies self-government. One who is governed by others has no freedom at all, and one who is partially governed, of course, has only partial freedom. Free institutions are institutions that carry into effect the principle of self-government, and the freest institutions are those which carry the principle nearest to perfection, and reduce to a minimum all external control. Liberty and justice demand self-government. History shows that wherever one man or group of men have controlled others without responsibility to them, injustice is sure to result. There is no way of controlling the affairs of a group of men in the interest of and to the advantage of those men and those people, except to make those people the final judges of what those interests are and the method by which they shall be administered. Even if—and it is hardly possible—the control lay as I have said, as long as humanity is selfish the law is apt to be perverted through the power of those who govern to their own selfish purpose. That is an element in the case, of course; but even with this injustice eliminated, there would still remain the equal wrong of denying the people the educating, refining and ennobling effect of managing their own affairs.

Self-government, then, is the essence of liberty and the foundation of justice. It is, therefore, the basic principle of our institutional structure, whose objects are justice and liberty. So fundamental is this in our system of government that by high authority it has been held to be inherent in our system, underlying and permeating our Constitution and statute books, so that any law whatever which violates that principle is defective and will be held void by the courts, even though it does not contravene any express provision of the Constitution under which it is enacted. Such decisions as that have been made in the *People vs. Harvard*, 24th Mich., 44, and the *People vs. Detroit*. Other decisions to the same effect in other States could be cited. But while it is recognized by our law that this principle of self-government underlies our institutions, and is the necessary basis of free government, yet our law has not resulted in the consistent application of that principle, at least in four respects. In respect to area, in respect to classes, in respect to departments of life and in respect to methods. First, in respect to area. The principle is recognized by our law, at least fully in theory, so far as the nation, state and individuals are concerned, but it is not recognized by our law so far as cities and towns are concerned. The municipality is, according to our laws, the creature of the Legislature.

Detroit has no right to govern herself, no recognized right of home rule. Every other city in the State must be consulted by Detroit by its representatives in the Legislature in order that Detroit may have the right to do anything or retain any right which it has at present. To see the full extent of this doctrine I refer you to Dillon on Municipal Corporations, Section 85 to 89, and in the 102d United States, 472, where the law is laid down by the Supreme Court of the United States to be that the Legislature has the right to grant or take away any power it sees fit to, to consolidate, to cut up and even to abolish any municipality in the State over which the Legislature has control. In the second place, the application of the principle of self-government is incomplete as to classes. We have not a government of the people by the people. We have had, possibly, government of the people by the men. We have not a government of the people and by the people, because women are a part of the people. Now, I am not sure that the full principle of self-government should be applied immediately to the full

extent that we should give the women self-government, at least not until they have shown that they take a greater interest in it than they have so far, or until they manifest an intelligent desire, an earnest wish to have it. But my statement holds good that the principle of self-government has not yet been applied over the whole region of classes. Then, again, you may notice the similarity between cities and women. They are both awaiting emancipation. The men have been emancipated to a large extent, and to a large extent they have self-government; cities and women have not. There are legal grounds, you see, therefore, for calling a city "she," as we are in the habit of doing. In the third place, as to the departments of life, the principle of self-government is imperfectly applied. We do apply it in a way to political life, but we have made no efforts to apply it seriously in business or to apply it in industrial life. Workingmen have no voice in the management of the industrial class to which they belong. They may come close to it some time through the growth of the public ownership of monopolies, but to be complete the workingmen of the country must come to have a part in the government of the industrial group to which they belong, as well as a part in the government of the State or nation to which they belong. In the fourth and last place, as to method, we have not yet applied the principle completely. The people themselves, neither in nation, in states, in cities, nor anywhere else, have complete control of the government, but only spasmodic control. At the time of an election the people are really sovereign, but they are not continually sovereign in between.

The Legislature, the courts, city councils, are all masters of the people between elections. They can pass laws which the people must obey and cannot object to. They can refuse to pass laws and the people can do nothing until the terms of these legislators have expired. The people, then, are not the real sovereigns all the time. They have simply a sovereignty which enables them to choose periodically a new set of masters, a privilege which a child under guardianship might have, the power to choose a new guardian periodically.

The remedies for this imperfect application of the principles of self-government seem to lie in the initiative and referendum, so as to give the people perpetual sovereignty, so that they can stop any evil legislation, and so that they can cause to be put before the people for a vote any law that they see fit to question, and so that the agents of the people in legislation, in our legislative halls and in Congress shall be really agents. What is an agent? An agent is one to carry out the will of another, not to carry out his own will. If an agent attempts to do something that the principal does not wish him to do, certainly in commercial life, the principal calls him down at once. Can we do that with our Legislatures, our City Councils? No, we cannot. A pretty agency it would be where the principal had to wait until the term of an agent for a year or two was up before he could assert his principalship and say to the agent, "You shall not carry out that plan." Suppose I employ an architect, and the architect makes the plans for a building under my orders, and then, without consulting me, after the plan is completed, to see whether the plan suits me or not, goes to work and builds the building and puts his hand in my pocket to take pay for it. A pretty high-handed sort of an agent that architect would be. To come within the scope of his agency he would have to consult with me as to the plans and see if they suited me. And so if you hire a cab, you don't have to take the instructions from the driver as to what direction you will go, but if you hire a legislator you have to swallow the laws that are passed by the body of which he is a member, whether you like them or not, until the term is up. In the second place, the second remedy would be, when the time comes for it, woman suffrage.

To give every thoughtful, intelligent person, male or female, the right to vote for the laws that are to govern them. In the third place, the remedy for another defective application of the principle is the public ownership of public utilities, or in the last place, one that I wish to speak about for a few moments most emphatically—home rule for cities. I am going to speak in the next ten minutes, or devote the rest of my talk to the principle of the application of self-government to cities, so as to give them the right to govern their own affairs, the same right that a nation has to govern national affairs, the same right that a State has to govern itself, in respect to State affairs; the same right that an individual has to govern himself, that right a city or town should have to govern over the State, over the Nation, in respect to its own peculiar internal local business. But I say that although I wish to speak of that, please do not forget that to make even that self-government complete the city must have the initiative and referendum, it must have public ownership, and it must have, finally, woman suffrage, or else the complete application of the principle will not obtain in that city. To show you first to what extent the principle of home rule is denoted, let me give two or three concrete illustrations. In the first place, a city or town, in most of our States, has no initiative at all, no right to do anything new without going to the Legislature for permission. Suppose that a city or town learns of the fact of the advantage of a municipal telephone service as Glasgow did—Glasgow has asked for the right to establish a municipal system—or suppose that in one of our cities—in Manhattan, Kan.—there is a public telephone system and a private system, and where, after allowing for all expenses of the public system and for 7 per cent. depreciation and full interest, there is yet 25 per cent. of clear profit upon the investment, and the charges are for residences \$1 a month and for business places \$2 a month. Suppose that they learned that the Government in Washington some years ago were paying to the Bell Telephone Company \$75 a year for telephones, that they asked for a reduction, which the Bell company refused; that they then put in their own telephones, and that today the yearly expense, the operating expenses and fixed charges are only \$10.25 per telephone. Supposing that, learning these facts, a municipality desires to put in a public telephone system. Could it do it? No, not without going to the Legislature and getting permission from the representatives of all the other towns and cities in the State practically before it could introduce this improvement into its public works. And so with everything else. Take the Brooklyn and New York Bridge. Passengers that go across on foot pay nothing. Passengers that go across in cars pay 2½ cents. Go to St. Louis, on the bridge across the river there, and you will find foot passengers paying 5 cents per person, and those who go across on cars pay 25 cents, and on some of the railways, they tell me, even as high as 75 cents. Yet the Brooklyn bridge cost \$15,000,000, while the St. Louis bridge cost only \$10,000,000; and the Gould interest that now has it did not pay nearly \$10,000,000 for it in the foreclosure proceedings under which it got it. Now suppose that the two cities on opposite banks of the river should want to combine to build a bridge. Can they do it? Not unless express permission has been given in their charter, or they go to the Legislature and get the power. A few years ago here in Detroit an offer was made by respectable parties to take all the street railway systems here and run them together as a single plant at a uniform fare of 2½ cents. Governor Pingree was Mayor then, and Governor Pingree said that they could have done that if the city had had a right to condemn and take them for public use and bond them, and a profit would have been paid, together with all interest and fixed charges, and the roads run in good condition under city supervision and with a

2½-cent fare. Why wasn't it done? Simply because the city had no right to rule itself in regard to internal affairs, but had to go to the Legislature for permission, and the Legislature was not in session. The opportunity passed and this great public benefit with it. As a second illustration, take the case of Philadelphia, Pa. In 1870 the Legislature concluded that Philadelphia had better have an improved City Hall. So they appointed a commission and gave them power to make the plans and build the building for the city, compelling the city to pay for this building. That law was held constitutional, as you will find by referring to the 86th of Penn., 27c. It was held constitutional, although it took millions and millions of dollars from their treasury without their consent to build the building, something which they didn't wish should be built; and they got a building which cost them twice, as some persons say, what it should have cost. Yet the Legislature had the power to do that. As a third illustration, the Legislature has the power to take the management of waterworks out of the hands of a city and put them in the hands of the State officials. That has been done and upheld. See the 7th of Houston, pages 44 and 348. That will give you cases of that kind. For a statement of a claim that a city has no right even to the use of its private property see the 31st New York. In that case the honorable justice said that the city does not own any property at all; that it is simply a trustee for the State; that the State owns the streets, and the electric light plant, if it has one, gas plant and water system, and they can be taken away from the city absolutely without compensation. The city is not protected by constitutional provisions under that decision. But that goes further than most of the decisions do.

In the fourth place, the franchise given to a city is not a contract. Now, gentlemen, please let that sink deeply into your minds. Suppose that in some acts of the Legislature a franchise is given to a private company to run or build an electric light plant, and by a similar act of franchise the right is given to a city to run a street railway and build an electric light plant. The courts hold, with practical uniformity over the country, that in the first place it is a contract, and cannot be violated by the Legislature; but, in the second place, the franchise to the city or town is not a contract, and can be taken away from it at the pleasure of the Legislature without any power reserved to that effect. It has been done in several cases. Look at the case in the 10th of Howard, U. S., 511; here the Supreme Court of the United States sustained legislation in Connecticut, taking away a ferry from East Hartford that had been granted many years before. In the last place, a charter of a city is not a contract. The granting of a franchise or a charter to a small body of stockholders is a contract, but the granting of a franchise to a large body of citizens constituting a city is not a contract, and is not protected by the Constitution of the United States. Again, legislation can unite two cities in one without their consent, cut them in half and make two, or abolish a city altogether, if it sees fit. Imagine the Congress of the United States uniting Rhode Island and Connecticut and making one State out of them. Imagine the Congress of the United States dividing the State of New York into two without its consent; yet, in principle, if the application is correct as to cities, that could be done. It is just the same thing exactly. Imagine the Legislature saying to Mr. Smith "The house you live in isn't as elegant as you can afford. We will appoint a State commission and build a better house for you, and you can pay for it." The Legislature couldn't do that; the courts would not sustain it. But the Legislature can say to Philadelphia: "We will build a better house for you and you can pay for it," and it is sustained. What reason is given? John Stuart Mills wrote years ago upon the subjection of women. It is time that a book

was written upon the subjection of cities. But what is the reason? Why, the reason given by the courts is that the Legislature creates the cities, and, therefore, has the right to take away their power. Upon the same reasoning a father, who is the cause of the life of his child, could have the right to murder that child, or cut him in two. Such reasoning is just as good in one case as in the other. But what is the real reason? Simply this, I think a notion has grown up that between the functions of cities and towns which are for State purposes, and the functions of cities and towns which are really for private business purposes, there is no difference, and for so many years Legislatures have been in the habit of using cities and towns for the accomplishment of State purposes, that gradually the idea has spread over the whole field and they have failed to distinguish the principle stating the purposes for which towns and cities are used from private business purposes, in which relation they should stand upon just the same ground as a private corporation, or a private business partnership or individual should stand. Some of the courts have made decisions, a few instances of which I will give. I will just name two or three for example. For instance, you cannot tax a city or town except for the purposes of the public; all the authorities agree upon that. In the second place, most authorities hold that a city and town has the right to the use of its private property, but it cannot destroy it. You can take away from a city the management of an electric light plant or water plant, but if that is done it must be administered for the use of the inhabitants of that city. In the third place, some courts hold that even the management of the private property of a city or town cannot be taken away from it. And I want to call your special attention to cases in which your own Justice Cooley and Judge Christiancy here in Michigan decided; the 24th of Mich., 44, and the 28th of Mich., 228. In those cases it was decided that self-government is not inherent in our city governments, and that the right to elect officers to control the city water works and city gas plant cannot be taken away from any town or city by act of the Legislature, even if there be no express provision in the Constitution in conflict with such legislation. They say that the principle of self-government underlies our institutions and is a necessary basis of free government, and the Legislature cannot violate that principle. I wish we could apply those decisions to other cities.

Now just a word about the results of this government, this incomplete application. The situation that results from this application of the law may be summed up in this way

First, a chaotic mass of legislations and decisions, mighty in bulk and complexity, but very brief in definite simplicity and harmonious interpretation of the fundamental principles which characterize our law. In the second place towns and cities in most of the States come every year to the Legislature for its permission to do this or that or the other thing, to build a street railway or an electric light plant or some of the other various things that a city needs—they all have to come to the Legislature to get permission. One-third of the legislation in Massachusetts and in New York is made up every year of these special acts to enable the cities and towns to do something that they have not received the right to do. I should like to give you a little idea of the chaos in legislation upon these municipal subjects, and by referring to a chart I will perhaps be able to make myself clear. [A chart was here exhibited, but was not obtained for reproduction.—Ed. C. G.] Now this cross in the centre means that there is a general law of some nature giving cities and towns and villages, or all, the power to control the streets. Maine has the power to control the streets, also the fire department. No city has any power in the State of Maine. If

any city in the State of Maine wants to do anything of that kind it must go to the Legislature and get permission. But telegraph and telephone systems may be established. No general law in Maine. There is a general act which covers a number of things, such as schools, libraries and parks and baths. Now you will notice that legislation in most of the States has been pretty free upon most of the cities. In some, however, it has been almost nothing. Delaware, for example, has pretty nearly always refrained from general legislation empowering cities to act in their own behalf. It is the same way in Maryland. Alabama has very little, but Minnesota has a great deal. But even where there are States that have a general law all the way through you must look through from 100 pages to 1,400 pages, or perhaps 2,800 pages, or perhaps 3,600 pages, as in New Jersey, to find all the scattered law that empowers cities, villages and towns to do this and that and the other thing, to know what the law is. That is wrong. The powers of cities ought to be contained, so far as legislation is concerned, within small compass, as it is under the rule that obtains in Germany. This is one lesson at least that Germany can teach us. Cities and towns there have the right to do anything that they see fit, provided that what they do does not conflict with any State or national law. They have perfect form for cities. They have perfect freedom there for their cities, subject only to superior law. It is just the contrary to our law. Our cities can do nothing without express permission. German cities can do everything, except when it is expressly forbidden. Now, another thing; legislation can change these laws at any time. The existing lack of uniformity in the different States necessarily causes the body of the law to exist imperfectly and in a state of complexity which makes it very clear that legislation is not the true remedy for the present lack of freedom in our cities. There are constitutional provisions in some of the States which guarantee the local election of all officers. That is a great point gained. There are also constitutional provisions to the effect that there will be notices given in case of any contemplated special legislation. That is, if the Legislature contemplates the passage of any law applying to one city or town or a few; there is a provision in the general law that there shall be a notice given, so that the city and towns affected can appear and fight it if they see fit. Another constitutional provision relates to the rule that there shall be no special legislation at all respecting cities, or there shall be none respecting the election of officers. There are also others that there shall be no special legislation respecting streets; no special legislation respecting franchises or corporations. Then there are also provisions which require the consent of municipalities to the granting of a franchise or to the changing of municipal powers and liabilities. In another class, a small class of States, there is a constitutional provision that the cities and towns, or some of them, shall have the right to make their own charters. In Missouri cities of 100,000 inhabitants have that right. In California cities of 35,000 and up have that right. In Washington cities of 20,000 have that right. In Montana all cities and towns have that right. In Louisiana a statute was passed in 1896 giving all cities and towns except New Orleans the right to make their own charters. In a number of cities that right has been used. I have a number of charters here, but I will refer simply to one. That is the charter of San Francisco, the last one adopted. I will call your attention to two provisions in it. In the first place, on pages 7 and 8, the right of the initiative and referendum is guaranteed in respect to all ordinances. If the city government and board of supervisors pass any ordinance that the people do not like, 15 per cent. of the voters can sign a petition that it shall be submitted to the people, and it has to be submitted, and is finally voted upon by the people. If the board of

supervisors fails to pass any ordinance which the people desire, 15 per cent. of the voters can sign a petition that such matter shall be acted upon, and it has to be submitted to the people to see whether they want it or not. Again, in Section 22, there is a provision to this effect: "Whenever there shall be presented to the supervisors a petition signed by a number of voters, equal to 15 per cent. of the votes cast at the last election, asking that an amendment or amendments to this charter be made, such petitions shall be submitted to the people." The board must submit it to a vote of the electors of the city. The people have the government, therefore, in their own hands. They can propose an amendment to the charter. They can have this amendment submitted to the people. They have complete control of the city government. There you have at last, for the first time, I believe, in the history of America, a city that has really self-government under a recognized right to self-government.

There have been many cases of New England towns that have exercised this right within special lines marked out by the charter. But that instrument might be changed by the Legislature at any time. But the right to continuous self-government did not exist. Here we have a city that has a constitutional right to govern itself as well as the actual government in their own hands by the initiative and referendum. If that is not a glorious bit of progress for this year, 1898, I have seen nothing that has given me so much encouragement for the future in respect to progress towards real self-government as this charter of San Francisco. We turn to page 124, Article 12, and we find

this: "It is hereby declared to be the purpose and aim of the people of the city that all public utilities shall be gradually acquired and ultimately owned by the city in common." The people of San Francisco certainly do know a good deal. There is a clear declaration of a purpose gradually to come into the ownership of all the city's public utilities. I have a letter which says that that charter was passed by the conservative element in San Francisco, and that it does not satisfy the radical element at all. You will notice, please, the black lines upon the chart opposite to some of the States. They belong to the black group. They are very backward as far as constitutional provisions are concerned. They have given their cities and towns very little liberty. Ohio and Michigan are not in the black group. They have done something, but they have not yet given full liberty to the people.

I see that the time is about up, and I will close simply with this point, that municipal home rule not only simplifies the law and relieves the Legislature, but it puts the control of franchises and local offices where it belongs, upon the shoulders of the people that know something about it. It will shut out the jobs, contracts and the legislative dickering with scheming men now put up upon the principle: "If you will give me what I want, I will let you govern in your town and I will pass your laws and let you govern." It would build up local patriotism and it would clear the path of progress. To-day progress is blocked—municipal progress—largely because of the necessity of fighting every measure through the Legislature against the tremendous influence of private interests; against the

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indifference of more or less alien and always overcrowded Legislatures and against the wide lack of local patriotism and municipal indifference. Nothing, I think, can do more for pure government, for progress, for patriotism, than municipal home rule. Dr. Albert Shaw, who, I suppose, is one of the greatest students of municipal affairs, says: "Good government and progress in our large cities will be greatly aided by the extension of their powers of local self-government or the establishment of municipal home rule, so that the people may see that they have their own municipality, for weal or woe, clearly and definitely in their own hands." I think no truer words have ever been said than just those. The gateway of progress and of municipal interest lies largely through those two doors. First, of municipal freedom under constitutional enactment, and the power to make their own charters, to elect their own officers, to grant their own franchises and to manage their own private business and to own and operate public utilities if they see fit upon a referendum vote by the people. To have the initiative and referendum thoroughly carried out with a clear line drawn between National and State interests on the one hand and city interests on the other, so that we may know clearly before-

hand to what these principles apply. Simple home rule, municipal self-government with the initiative and referendum, making it real self-government, and not a government by council instead of by the people. Municipal home rule, self-government, when we have that with the initiative like the San Francisco charter, then we shall have a chance to build real citizenship that will finally solve not only municipal, but State and National problems as well.

LIGHTING PRICES IN BOSTON.

—Former Mayor Matthews, of Boston, has submitted to the board of aldermen of that city a report of his investigation of municipal lighting. He concludes that the prices now charged for arc electric lights in Boston, namely, \$127.75 for street and \$124.10 for park lights per annum, are, if the company supplies the entire machinery and fixtures (including lamp-poles), except the circuits within the limits of the several parks, on the whole, and taking into account all the differences in local conditions that are capable of being represented in dollars and cents, slightly lower than the cost upon a com-

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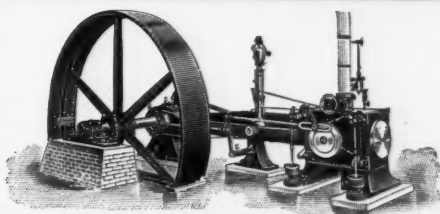
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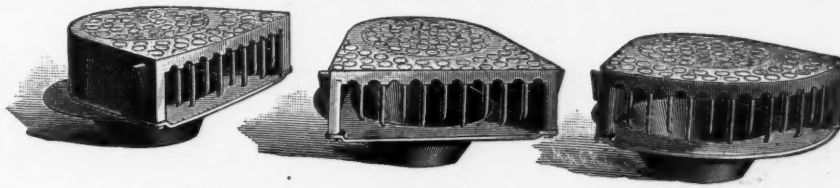
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mercial basis of the lights furnished by the municipal plant in Detroit, considerably lower than the cost upon a commercial basis of the lights furnished by the municipal plant in Chicago, considerably lower than the prices charged for street lights by the private companies of New York, Philadelphia and Baltimore, and about the same as the prices charged by the private companies of Chicago. Mr. Matthews recommends that a new contract be entered into with the lighting company, with the understanding, however, that the latter shall agree to furnish all the latest improvements and cheapening devices, and furthermore that at every increase of 250 in the number of lights the price be reduced by one-half cent per night until 30 cents per night is reached. It is also suggested that the price of lighting be regulated, and thus the city's interests guarded, at comparatively short intervals, by means of an arbitration committee

composed of three members, one appointed by the city, the second by the lighting company and the third by the persons thus selected.

—B. S. Flanders, superintendent of fire alarm, Boston, upon the request of Mayor Quincy and Fire Commissioner Russell, officially examined the Montauk multiphase cable and reported that it appears to be a valuable adjunct for use in any automatic fire alarm service, depending on the action of thermostatic devices for its operation. Mr. Flanders bases his opinion on the fact that the cable is so constructed that it is thermostatic throughout its entire length, and will therefore be available for operating the system with which it is connected should a fire occur at any point where it is placed. On this account, in his opinion, it is superior to the isolated thermostats used in the present automatic systems.

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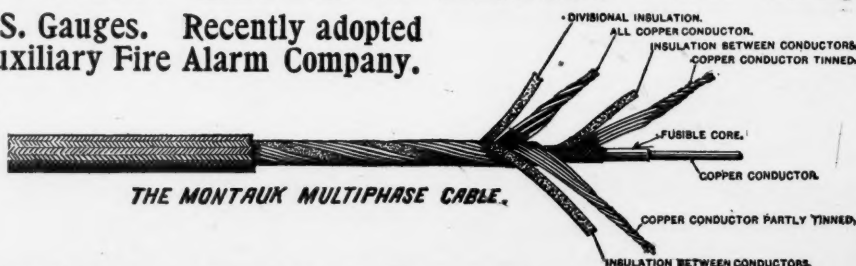
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" 565,178	" 594,247
" 565,188	" 594,281



THE MONTAUK MULTIPHASE CABLE.

WRITE FOR DESCRIPTIVE MATTER. CALL AND SEE CABLES DEMONSTRATED.

MONTAUK MULTIPHASE CABLE CO., 100 BROADWAY, NEW YORK.

Government and Municipal Bonds

BOUGHT AND SOLD.

ALSO FIRST MORTGAGE BONDS OF ESTABLISHED
STEAM AND STREET RAILWAYS.

APPRAISEMENTS MADE OR QUOTATIONS FURNISHED
FOR THE PURCHASE, SALE, OR EXCHANGE OF ABOVE
SECURITIES.

LISTS ON APPLICATION.

N. W. HARRIS & CO., BANKERS,

NEW YORK. CHICAGO. BOSTON.

31 NASSAU STREET, NEW YORK.

CABLE ADDRESS—SABA.

(Over.)

Supplement to CITY

EXHIBIT "A"—RATES OF TAXATION IN THE

A Paper submitted to the American Society of Municipal

QUESTIONS SUBMITTED. (All figures are approximate.)	NEW YORK CITY, N. Y.	CHICAGO, ILL.	PHILADELPHIA, PA.	ST. LOUIS, MO.	BOSTON, MASS.	BALTIMORE, MD.	CINCINNATI, OHIO.	CLEVELAND, OHIO.	SAN FRANCISCO, CAL.	BUFFALO, N. Y.	DETROIT, MICH.
1. Estimated Population, 1898.....		1,850,000	1,240,000	628,000	528,912	500,000	410,000	380,000	350,000	375,000	300,000
2. What is the Grand Duplicate of your city available for taxable purposes?											
Real Estate.....		184,632,905 00	862,801,670 00	303,609,800 00	330,194,900 00	236,131,307 00	161,677,104 00	106,753,620 00	283,088,984 00	230,425,520 00	169,087,000 00
Personalty.....		38,594,167 00	1,714,365 00	50,379,210 00	205,868,190 00	59,463,510 00	35,000,000 00	35,161,810 00	68,695,110 00	15,249,110 00	38,549,000 00
Total.....		\$232,026,610 00	\$864,516,035 00	\$353,988,510 00	\$1,036,063,090 00	\$362,122,738 00	\$196,677,104 00	\$141,915,430 00	\$351,784,094 00	\$245,674,630 00	\$207,636,000 00
3. What is your tax rate per \$1,000? (This to include State, County, Municipal, Educational, Sinking Fund and Interest, Special, and all other purposes.) Do not include Waterworks.....		\$96.50	\$18.50	Max. \$20.50 Min. \$16.70	\$18.60	\$24.375	\$26.18	\$29.30	\$16.95	\$23.54	\$19.20
4. How is this total made up?											
State Levy.....		6.60	None.	2.50	.54	1.875	2.84	2.84	5.10	Included in county levy.	Included in county levy.
County Levy.....		7.80	{ City levy includes county levy.	{ City not within a county.	1.06	No county levy.	3.61	4.26	{ Included in municipal levy.	4.76	4.76
Municipal Levy.....		46.20	9.20	9.80	5.21	12.35	9.07	10.70	10.18	13.28	13.28
Educational Levy.....		29.30	2.20	4.20	2.67	4.575	4.43	8.60	1.50	3.90	3.90
Sinking Fund and Interest Levy.....		6.60	7.10	4.00	4.12	5.575	5.10	2.90	.17	1.60	1.60
Special Levy (street railroads).....							1.13				
Total.....		\$96.50	\$18.50	\$20.50	\$18.60	\$24.375	\$26.18	\$29.30	\$16.95	\$23.54	\$19.20
5. At what per cent of its true value is real estate placed on the duplicate for taxable purposes in your city?.....		About 11 per cent.	About 75 per cent.	From 60 to 66½ per cent.	The assessors are required to assess real estate at its "fair market value."	About 75 per cent.	58 per cent.	35 per cent.	75 per cent.	70 per cent.	65 to 70 per cent.
6. What sources of income, if any, have you in your city, exclusive of taxation, that are applied for maintenance of municipal and other departments? Estimated for the year 1898.											
Earnings and unexpended balances.....		1,368,974 88	1,333,036 06	95,039 88	225,040 00	1,500,000 00	104,162 78	232,600 00		295,962 16	*1,810,900 00
Liquor license, including tobacco, etc.....		3,025,418 80	1,690,047 50	945,000 00	1,085,000 00	410,000 00	427,000 00	427,000 00	380,000 30	580,000 00	225,000 00
Street railroad licenses and fees.....		80,332 74	77,744 00	92,100 00	50 00	266,000 00	180,000 00	7,800 00	10,000 00	46,000 00	22,000 00
General licenses.....			91,118 00	394,000 00	8,000 00		53,000 00	23,200 00	86,000 00	45,000 00	13,500 00
Vehicle licenses.....		24,873 41	2,151 21	40,000 00	36,500 00	65,000 00	57,800 00		26,000 00		2,500 00
Fines, fees, costs, and all other miscellaneous items.....		938,415 34	285,221 52	374,050 00	1,032,600 00	20,000 00	53,000 00	61,000 00	217,700 00	50,000 00	75,000 00
Total.....		\$5,433,215 17	\$3,479,313 29	\$1,940,189 88	\$2,387,640 00	\$2,261,000 00	\$874,962 78	\$756,600 00	\$1,400,700 00	\$1,046,962 16	\$2,148,900 00
7. In what manner is this income distributed?											
Unexpended balances.....		To General Fund (saved, not appropriated) unexpended balances only. Earnings of House of Correction to House of Correction Fund.	All turned in to General Fund and then appropriated with taxes and other moneys received.	All collections in nature of revenue or income are credited to one of four funds, viz.: Interest and Public Debt Revenue, Municipal Revenue, Waterworks Revenue, Harbor Fund. Appropriations are made from these funds for the various requirements.	Unexpended balances of appropriations for current expenses are returned to the general treasury. Unexpended balances of loans are allowed to remain to the credit of their respective appropriations. Sales of land and buildings and the premium on bond issues are paid to the Sinking Fund Commissioners. Income received for work done or services rendered is turned to the department performing the work. All other income is turned into the general treasury to meet appropriations.	Applied to cost of maintenance of municipality. Tax levy made for balance.	To the funds in which balances remain; earnings such as Workhouse, etc., to the fund necessary to maintain such institution.	Distributed among six different funds.	See above	\$264,899.69 to the funds in which such balances belong; earnings (such as interest on bank balances, \$16,148) go to General Fund.	Balances to funds; interest city money to General Fund; house earnings where direct council; other funds to various departments.
Liquor licenses.....		Added to other receipts from miscellaneous sources and distributed as ordered by the City Council for corporate purposes. Same as above.	Same as above.				Distributed nearly equally between General, Watch, and Infirmary funds.	Distributed nearly equally between General, Watch, and Infirmary funds.	Same	Three per cent (not included in the \$580,000 above) of liquor licenses to the Police Pension Fund, balance to Police Department. Percentage of receipts go to General Fund.	Poor, Health, etc.
Street-railroad licenses.....		Same as above.	Same as above.				Partly for general purposes, partly for street-cleaning and repairs. For general purposes.	To General and Market funds.	Same	To General Fund.	General Fund
General licenses.....		Same as above.	Same as above.				Repair and cleaning of streets. General purposes.	Same as above	Same	No vehicle license.	General Fund
Vehicle licenses.....		Same as above.	Same as above.					To various funds producing same.	Same	To General Fund; the receipts of the General Fund are estimated at \$218,000, which is deducted from the estimated cost of running the municipality before striking the amount to be raised by city tax.	General Fund, Fund, Sinking Fund, according to class of line.
Fines, costs, etc.....		Same as above.	Same as above.						Same		
8. What was the rate in 1898 for the following purposes in your city? (Taxes only for these purposes.)											
Watch Fund.....		12.529	2.00	No separate levy.	No separate levy.	No separate levy.	1.997 mills.	1.58	\$1.895	{ Not divided into items. .743	\$2.20
Light Fund.....		.024	.40	Same.	Same.	Same.	1.694 ..	1.55	.87	{ Not divided into items. .743	.38
Fire Fund.....		6.041	.70	Same.	Same.	Same.	2.170 ..	3.29	1.63	{ Not divided into items. .743	2.70
Street-cleaning Fund.....			.80	Same.	Same.	Same.	.829 ..	.89	.29	Same.	.629
Education.....		50.299	2.20	4 mills.	\$2.67	Same.	4.430 ..	8.60	1.502	Same.	3.63
9. What is the appropriation or estimated expenditures for											

Extract from letter of N. P. Lewis, member American Society of Municipal Improvements, borough of Brooklyn, city of New York: "The Comptroller says that while he is very glad at all times to give information of this kind, he is not willing to do so unless it is absolutely accurate, and that, owing to the fact that ninety-six different corporations were wiped out of existence through the consolidation of the city, it is impossible to prepare an accurate statement showing the rates of assessment and taxation and sources of revenue. He appreciates the importance of obtaining such information, and he is therefore unwilling to give out any thing which he may hereafter be obliged to correct. As the information you ask for can not be obtained elsewhere, I am afraid it will be impossible for you to secure it. Regretting that this is the case, etc."

to CITY GOVERNMENT, New York, December, 1898.

ON IN THE LARGER CITIES OF THE UNITED STATES—TABULATED STATISTICS

American Society of Municipal Improvements at its Fifth Annual Convention, Washington, D. C., October 26, 1898, by August Herrmann, Cincinnati, Ohio.

FRANCISCO, CAL.	BUFFALO, N. Y.	DETROIT, MICH.	NEW ORLEANS, LA.	PITTSBURG, PA.	MILWAUKEE, WIS.	NEWARK, N. J.	LOUISVILLE, KY.	MINNEAPOLIS, MINN.	JERSEY CITY, N. J.	INDIANAPOLIS, IND.	ROCHESTER, N. Y.	KANSAS CITY, MO.	PROVIDENCE, R. I.	ST. PAUL, MINN.	OMAHA, NEB.	ALLEGHENY, PA.	COLUMBUS, OHIO.	ALBANY, N. Y.
350,000	875,000	300,000	300,000	295,000	270,000	250,000	222,000	210,000	200,000	195,000	175,000	175,000	166,000	165,000	150,000	125,000	135,000	100,000
82,088,954 00	280,425,520 00	169,087,260 00	102,316,105 00	265,861,788 00	121,156,099 00	111,079,904 00	89,000,000 00	91,793,944 00	82,415,220 00	81,460,515 00	101,897,375 00	52,000,000 00	142,480,200 00	78,500,000 00	27,423,970 00	75,500,000 00	49,661,330 00	58,768,000 00
68,695,110 00	15,249,110 00	88,549,600 00	86,888,808 00	1,902,284 00	23,527,326 46	27,798,994 00	29,800,000 00	17,860,393 00	7,547,541 00	39,589,955 00	10,895,615 00	15,750,000 00	39,127,920 00	14,500,000 00	5,625,533 00	.....	13,023,750 00	9,508,000 00
51,784,094 00	\$245,674,630 00	\$207,636,860 00	\$139,199,913 00	\$207,764,072 00	\$144,683,423 46 Deduction for indebtedness { 1,406,593 00 Net valuation { \$138,373,305 00	139,778,898 00	\$118,800,000 00	\$109,654,337 00	\$89,962,761 00	\$121,000,470 00	\$112,792,990 00	\$67,750,000 00	\$181,558,120 00	\$98,000,000 00	\$33,049,503 00	\$75,500,000 00	\$62,685,080 00	\$68,276,000 00
\$16.95	\$28.54	\$19.28	\$27.00	\$28.65	\$23.12	\$21.00	\$23.65	\$25.00	\$28.90	\$17.30	\$20.73	\$26.24	\$16.50	\$21.40	\$47.125	\$24.95	Does not include street cleaning \$27.00	\$20.00
5.10 Included in municipal levy.	Included in county levy. 4.76	1.78 1.46	7.00 No county levy.	Bond and mortgage { 4.00 2.00	3.86 2.66	No state levy 6.50	State and county { 5.25 13.10	3.08 3.67	2.70 5.84	2.967 3.20	2.545 2.287	State and county { 6.24 10.00	1.80 No county levy.	1.95 2.35	7.625 15.50	Bond and mortgage { 4.00 2.00	2.34 5.85	State and county { 4.00 10.00
10.18	13.28	11.42	10.00 { Partly included in Municipal, partly in Sinking Fund. }	10.00	10.28	8.34	8.30	9.70	11.17	6.223	8.798	10.00	6.11	9.295	17.90	8.75	6.97	10.00
1.50	8.90	3.63	Interest only; no sinking fund raised by tax'n { .94 10.00	2.65	3.85	3.63	3.30	5.00	1.68	4.20	4.32	8.00	2.89	4.50	2.80	4.65	6.60	3.00
.17	1.60	.....	.....	5.00	2.97	2.56	2.00	8.60	7.51	.71	2.78	2.00	5.70	3.305	3.80	5.55	4.74	2.00
\$16.95	\$28.54	\$19.28	\$27.00	\$28.65	\$23.12	\$21.00	\$23.65	\$25.00	\$28.90	\$17.30	\$20.73	\$26.24	\$16.50	\$21.40	\$47.125	\$24.95	\$27.00	\$20.00
75 per cent.	70 per cent.	65 to 70 per cent.	90 per cent.	100 per cent.	65 per cent.	70 per cent.	75 per cent.	100 per cent.	100 per cent.	70 per cent.	80 per cent.	40 per cent.	100 per cent.	40 per cent.	33 1/3 per cent.	100 per cent.	50 per cent.	90 per cent.
.....	295,962 15	*1,810,996 40	Bal. carried forward.	19,485 15	Very little, if anyth'g	57,500 00	48,991 20	.....	.....	.....	.....	22,200 00	No answer received.	.....	180,392 00	60,000 00	20,200 00	53,000 00
\$80,000 00	680,000 00	225,000 00	149,000 00	480,000 00	335,590 13	335,000 00	126,455 83	299,000 00	255,908 20	140,016 00	174,000 00	102,000 00	Same.	275,000 00	268,000 00	160,000 00	70,000 00	157,000 00
10,000 00	46,000 00	22,000 00	8,000 00	30,000 00	48,676 55	4,000 00	30,863 16	3,700 00	.....	.....	9,000 00	9,000 00	Same.	.....	.....	25,000 00	.....	.....
86,000 00	45,000 00	13,500 00	.....	139,100 00	49,050 03	13,000 00	98,244 64	9,687 86	8,781 30	13,118 75	.....	107,000 00	Same.	9,000 00	.....	67,490 00	350 00	.....
26,000 00	.....	2,500 00	168,000 00	46,000 00	4,390 00	3,500 00	22,453 65	4,805 52	.....	37,029 45	.....	.....	Same.	.....	24,000 00	15,000 00	.....	4,000 00
217,700 00	80,000 00	75,000 00 (Includes all fines imposed for past due taxes estimated at \$75,000.)	50,000 00 (about)	164,138 00	42,118 29	169,000 00	3,600 00	75,379 68	51,378 65	58,472 55	73,840 00	97,800 00	Same.	91,000 00	34,000 00	102,000 00	14,500 00	36,000 00
\$1,400,700 00	\$1,046,962 15	\$2,148,996 40	\$375,000 00	\$859,238 00	\$497,260 15	\$524,500 00	\$339,117 28	\$486,063 76	\$316,068 15	\$248,636 75	\$256,840 00	\$388,000 00	.....	\$375,000 00	\$506,392 00	\$429,490 00	\$105,050 00	\$251,000 00
See above	\$264,839.69 to the funds in which such balances belong; earnings (such as interest on bank balances, \$16,148) go to General Fund.	Balances remain. funds; interest on city money to Sinking Fund; Workhouse earnings where directed by council; other earnings to funds maintaining department.	Optional with council.	To the funds in which balances remain.	Earnings to the different funds, the departments of which have caused earnings.	Into a Contingent Fund, from which is paid the current expenses of the city.	To the funds in which balances remain; earnings and liquor applications to General Fund.	To General Fund.	.....	Nothing.	Nothing.	To General Fund.	To General Fund.	Distributed to a number of different funds.	To the funds in which balances remain.	To General Fund.	To the funds in which balances remain; earnings, such as Workhouse, etc., to the fund necessary to maintain such institution.	To the funds in which balances remain; earnings, such as Workhouse, etc., to the fund necessary to maintain such institution.
Same	Three per cent (not included in the \$550,000 above) of liquor licenses to the Police Pension Fund, balance to Police Department. Percentage of receipts go to General Fund.	Poor, Health, Police.	Same.	Into General Fund, from which all appropriations are made.	To Police Department and general city funds.	Same.	To Sinking Fund Commissioners to pay interest on bonded indebtedness.	Same.	To Street, School, and Sinking funds.	To General Fund.	To Sinking and Contingent funds.	Same.	Same.	Same.	School Fund.	Same.	Equally between General and Police funds.	Hospital Fund.
Same	.....	General Fund.	Same.	Same.	General City Fund.	Same.	Same.	Same.	.....	No such income.	To Sinking Fund.	Same.	Same.	Same.	No receipts.	Same.	.....	.....
Same	To General Fund.	General Fund.	Same.	Same.	Same.	Same.	Same.	Same.	To Sinking Fund.	To General Fund.	Nothing.	Same.	Same.	Same.	School Fund.	Same.	Street Repair and General funds.	Same as
Same	No vehicle license.	General Fund.	Same.	Same.	Same.	Same.	Same.	Same.	.....	Repair and cleaning of streets.	Nothing.	Same.	Same.	Same.	Same.	Same.	.....	Same as
Same	To General Fund; the receipts of the General Fund are estimated at \$218,000, which is deducted from the estimated cost of running the municipality before striking the amount to be raised by city tax.	General Fund, Court Fund, Sinking Fund, according to class of fine.	Same.	Same.	Same.	Same.	To General Fund.	Same.	To various funds.	To General Fund.	To Police, Contingent and Sinking funds.	Same.	Same.	Same.	Same.	Same.	General Fund.	Same as
\$1.895	Not divided into items.	\$2.20	No separate levy.	No separate levy.	No separate levy.	\$2.70	\$2.20	No separate levy.	No separate levy.	No separate levy.	\$1.159	No separate levy.	No separate levy.	\$1.760	3 1/3	No separate levy.	\$1.33	No separate
.87	.745	.38	Same.	Same.	Included in municipal levy.	No separate levy	No entire levy.	Same.	Same.	Same.	1.598	Same.	Same.	1.700	1 1/2	Same.	1.14	Same
1.68	Not divided into items.	2.70	Same.	Same.	\$2.87	1.75	2.00	Same.	Same.	Same.	1.598	Same.	Same.	1.760	3 1/3	Same.	2.70	Same
.29	Same.	.629	Same.	Same.	Included in municipal levy.	No separate levy	.80	Average \$1.20.	Same.	Same.	1.708	Same.	Same.	.640	2 1/3	Same.	Special assessment.	Same
1 502	Same.	3.63	Same.	Same.	3.85	3.60	3.80	\$5.00	Same.	\$4.20	3.940	Same.	Same.	4.500	2 1/3 and 1 1/3	\$4.65	6.60	Same

ENT, New York, December, 1898.

ES OF THE UNITED STATES—TABULATED STATISTICS.

onvention, Washington, D. C., October 26, 1898, by August Herrmann, Cincinnati, Ohio.

NEWARK, N. J.	LOUISVILLE, KY.	MINNEAPOLIS, MINN.	JERSEY CITY, N. J.	INDIANAPOLIS, IND.	ROCHESTER, N. Y.	KANSAS CITY, MO.	PROVIDENCE, R. I.	ST. PAUL, MINN.	OMAHA, NEB.	ALLEGHENY, PA.	COLUMBUS, OHIO.	ALBANY, N. Y.	NASHVILLE, TENN.	DENVER, COL.	TOLEDO, OHIO.
250,000	222,000	210,000	200,000	195,000	175,000	175,000	166,000	165,000	150,000	125,000	185,000	100,000	100,000	160,000	164,000
111,079,904 00 27,798,994 00 139,778,898 00 edness 1,405,593 00 ion 188,373,305 00	89,000,000 00 29,800,000 00 \$118,800,000 00	91,793,944 00 17,860,393 00 \$109,654,337 00	82,415,220 00 7,547,541 00 \$89,962,761 00	81,460,515 00 \$9,539,955 00 \$121,000,470 00	101,897,375 00 10,895,615 00 \$112,792,990 00	52,000,000 00 15,750,000 00 \$67,750,000 00	142,480,200 00 \$9,127,920 00 \$181,558,120 00	78,500,000 00 14,500,000 00 \$93,000,000 00	27,428,970 00 5,625,533 00 \$33,049,503 00	75,500,000 00 \$75,500,000 00	49,661,380 00 13,023,750 00 \$62,685,080 00	58,768,650 00 9,508,245 00 \$68,276,895 00	23,684,240 00 6,715,150 00 \$30,399,390 00	73,101,485 00 \$73,101,485 00	38,000,000 00 12,500,000 00 \$50,500,000 00
\$21.00	\$23.65	\$25.00	\$28.90	\$17.80	\$20.73	\$26.24	\$16.50	\$21.40	\$47.125	\$24.95	Does not in- clude street cleaning... } \$27.00	\$20.00	\$24.50	\$31.00	\$33.20
No state levy 6.50 8.34 8.60 2.56	State and } county. } 5.25 13.10 3.30 2.00	3.03 3.67 9.70 5.00 3.60	2.70 5.84 11.17 1.68 7.51	2.967 3.20 6.223 4.20 .71	2.545 2.287 8.798 4.32 2.78	State and } county. } 6.24 10.00 8.00 2.00	1.80 No county levy. 6.11 2.89 5.70	1.95 2.35 9.295 4.50 3.305	7.625 15.50 17.90 2.80 8.80	Bond and } mortgage } 4.00 2.00 8.75 4.65 5.55	2.34 5.85 6.97 6.60 4.74	State and } county. } 4.07 10.046 3.347 2.537	3.00 6.50 6.50 2.00 6.50	4.10 8.00 9.80 6.10 3.00	2.84 5.86 9.05 7.70 7.75
\$21.00	\$23.65	\$25.00	\$28.90	\$17.80	\$20.73	\$26.24	\$16.50	\$21.40	\$47.125	\$24.95	\$27.00	\$20.00	\$24.50	\$31.00	\$33.20
70 per cent	75 per cent.	100 per cent.	100 per cent.	70 per cent.	80 per cent.	40 per cent.	100 per cent.	40 per cent.	33 ¹ / ₃ per cent.	100 per cent.	50 per cent.	90 per cent	75 per cent.	50 per cent.	50 per cent.
Very little, if anyth'g 335,000 00 4,000 00 13,000 00 3,500 00 169,000 00 \$524,500 00	57,500 00 126,455 83 30,863 16 98,244 64 22,453 65 3,600 00 \$339,117 28	43,991 20 299,000 00 3,700 00 9,687 36 4,305 52 75,379 68 \$486,063 76	255,908 20 140,016 00 8,781 30 13,118 75 37,029 45 51,378 65 \$316,068 15	140,016 00 174,000 00 9,000 00 102,000 00 107,000 00 58,472 55 \$248,636 75	174,000 00 9,000 00 102,000 00 107,000 00 58,472 55 73,840 00 \$256,840 00	22,200 00 102,000 00 9,000 00 107,000 00 97,800 00 \$388,000 00	No answer received. Same. Same. Same. Same. Same.	275,000 00 268,000 00 9,000 00 24,000 00 91,000 00 \$375,000 00	180,392 00 268,000 00 25,000 00 67,490 00 15,000 00 34,000 00 \$506,392 00	60,000 00 160,000 00 25,000 00 67,490 00 15,000 00 102,000 00 \$429,490 00	20,200 00 70,000 00 350 00 14,500 00 \$105,050 00	53,745 00 157,000 00 2,150 00 60,000 00 4,386 00 36,014 00 \$251,145 00	17,250 00 2,150 00 60,000 00 23,000 00 \$102,400 00	No answer received. 195,400 00 4,000 00 35,818 82 4,940 00 56,855 16 \$297,013 98	100,000 00 100,000 00 6,000 00 16,000 00 5,000 00 \$127,000 00
Into a Contingent Fund, from which is paid the current expenses of the city.	To the funds in which balances remain: Earnings and Liquor applications to General Fund.	To General Fund.	Nothing.	Nothing.	To General Fund.	To General Fund.	Distributed to a number of different funds.	To the funds in which balances remain.	To General Fund.	To the funds in which balances remain. Earnings such as Workhouse, etc., to the fund necessary to maintain such institution.	To the funds in which balances remain. Earnings, such as Workhouse, etc., to the fund necessary to maintain such institution.	Hospital Fund, etc.	To General Fund.	Same.	Unexpended balances remain in fund for which same was levied.
Same.	To Sinking Fund Commissioners to pay interest on bonded indebtedness.	Same.	To Street, School, and Sinking funds.	To General Fund.	To Sinking and Contingent funds.	Same.	Same.	School Fund.	Same.	Equally between General and Police funds.	Same.	Same.	Same.	Same.	Divided among General, Police, and Infirmary funds.
Same.	Same.	Same.	No such income.	To Sinking Fund.	Same.	Same.	Same.	No receipts.	Same.	Same.	Same.	Same.	Same.	Same.	.....
Same.	Same.	Same.	To Sinking Fund.	To General Fund.	Nothing.	Same.	Same.	School Fund.	Same.	Street Repair and General funds.	Same as above.	Same.	Same.	Same.	General Fund.
Same.	Same.	Same.	Repair and cleaning of streets.	Nothing.	Same.	Same.	Same.	Same.	Same.	Same.	Same as above.	Same.	Same.	Same.	Cleaning and repairs of streets.
Same.	To General Fund.	Same.	To various funds.	To General Fund.	To Police, Contingent and Sinking funds.	Same.	Same.	Same.	Same.	General Fund.	Same as above.	Same.	Same.	Same.	General, Police Pension, Retreat, and Law Library funds.
\$2.70	\$2.20	No separate levy.	No separate levy.	No separate levy.	\$1.159	No separate levy.	No separate levy.	\$1.760	\$1.33	No separate levy.	\$1.33	No separate levy.	No separate levy.	No separate levy.	\$1.30
No separate levy	No entire levy.	Same.	Same.	Same.	1.598	Same.	Same.	1.700	1.33	Same.	1.14	Same.	Same.	Same.	.90
1.75	2.00	Same.	Same.	Same.	1.598	Same.	Same.	1.760	3 ¹ / ₄	Same.	2.70	Same.	Same.	Same.	2.50
No separate levy	.80	Average \$1.20.	3	Same.	1.708	Same.	Same.	About .540	3 ¹ / ₄	Same.	Special assessment.	Same.	Same.	Same.	.25
3.60	3.30	\$5.00	3	\$4.20	3.940	Same.	Same.	4.500	2 ¹ / ₂ and 1 ¹ / ₂	\$4.65	6.60	Same.	\$2.00	Same.	7.70

Light Fund.....		.024	.40	Same.	Same.	Same.	1.694 ..	1.55	.87	{ Not divided into items. }	
Fire Fund		6.041	.70	Same.	Same.	Same.	2.170 ..	3.29	1.63		
Street-cleaning Fund.....			.80	Same.	Same.	Same.	.329 ..	.89	.29		
Education		50.299	2.20	4 mills.	\$2.67	Same.	4.430 ..	8.60	1.502		
9. What is the appropriation or estimated expenditures for these same purposes in 1898? (This to include taxes and all other sources of income.)											
Watch Fund.....	Partly in construction of electric light plant.	\$3,330,182 00	\$2,697,618 75	\$958,960 00	\$1,685,000 00	\$980,000 00	\$574,000 00	\$396,000 00	\$738,000 00	\$771,705 00	\$534
Light Fund.....		1,009,255 00	1,813,361 75	Exclusive 377,593 77	650,000 00	375,000 00	335,140 00	229,000 00	350,000 00	340,782 00	124
Fire Fund		1,487,568 50	987,784 87	of super- 747,989 51	1,171,000 00	506,000 00	440,000 00	487,000 00	430,000 00	625,318 00	558
Street-cleaning Fund.....		616,924 56	909,583 00	vision > 236,500 00	315,000 00	385,000 00	190,000 00	159,000 00	135,000 00	397,988 00	133
Education		6,140,593 20	4,022,107 64	1,957,000 00	2,470,000 00	1,480,000 00	1,275,100 00	1,435,000 00	1,232,000 00	963,393 00	918
10. What was the bonded indebtedness of your city on January 1, 1898?											
School and university purposes		1,102,000 00	4,160,000 00		4,865,422 00		108,000 00			1,402,500 00	60
Erection, completing and furnishing new City Hall			7,805,300 00	2,240,000 00	5,900,214 00	1,500,000 00	900,000 00			725,000 00	
Park purposes.....					12,725,800 00	992,500 00	1,460,000 00	1,600,000 00		2,143,946 31	1,05
Hospital purposes.....							300,000 00				
Sewerage purposes.....		2,607,000 00	6,267,400 00		9,564,550 00		705,000 00	1,231,000 00		1,223,000 00	1,30
Miscellaneous purposes (pavements, viaducts, avenues, market-houses, etc.)		2,045,460 00		1,195,000 00	18,894,651 00		3,501,875 00	4,507,492 00	372,000 00	1,361,204 17	1,38
Funding and deficiency bonds.....			101,295 22			13,407,776 95	1,236,618 30	1,543,000 00		1,009,973 45	
Refunding debt.....		4,500 00	7,170,000 00	11,109,278 30		8,253,300 00	3,600,000 00			2,072,787 47	
Waterworks purposes.....	World's Fair {	3,939,000 00	Gas- } 8,203,700 00	5,808,000 00		7,750,000 00	1,175,000 00	2,087,000 00		3,941,882 00	1,00
	River Improvement {	4,517,000 00	4,460,500 00	South Union Station {	17,911,274 00						Public } 60
		2,605,500 00	4,500,000 00	Rapid transit subway {	1,600,000 00						lighting plan
			{ Subway P & R Ry Co.	County debt } 3,631,000 00							
Construction of the Cincinnati Southern Railway.....							18,622,000 00			Steam R.R. }	1,352,000 00
General bonds of annexed villages.....		198,000 00			Western Md R. R. Co. >	4,267,000 00	1,001,500 00				
Total bonded debt.....		17,018,450 00			79,592,911 00	36,170,576 95	32,609,993 30	10,968,492 00	372,000 00	Sink. Fund {	15,232,293 40
Deduct for bonds purchased and cash on hand.....		1,569,035 01			28,110,740 00	4,376,398 48	7,127,534 14	1,888,759 57	285,082 99		6,5
Net bonded debt.....		\$15,449,414 99	\$56,872,795 22	\$20,352,278 30	\$51,482,160 00	\$31,794,178 47	\$25,482,459 16	\$9,079,732 43	\$183,917 01	\$14,167,819 60	1,8
11. In the total tax-rate as given is any thing included for the improvement of streets, sewers, or sidewalks?											
	No; improvements of this kind made on the assessment plan	Yes.	There is no separate levy for these purposes; expenses on account thereof are met by appropriations from the proceeds of levy for general municipal purposes, or by special taxes assessed against property fronting the improvement, or in case of district sewers against property in that district	Yes; but no special rate for any of these objects. New streets on the assessment plan. By a recent law the cost of construction and maintenance of sewers and street watering is assessed upon the real estate. All other street work except the laying of sidewalks viz., street paving, is paid out of the general appropriation.		Yes; four tenths of a mill for construction of trunk sewers. All other improvements made on the assessment plan.	No; all are on assessment plan.	No answer received.	Paving of streets and building of sewers (new work) is paid for by local assessments; also any work solely affecting private property is assessed against the property benefited.	Yes; 78-100 for trunk all new pipes and made on assessment plan.	
12. Are taxpayers subject to any other assessment than the taxes and licenses herein referred to? If so, explain fully.											
	No; excepting water and special assessments for improvements as above.	No; except water-rents.	No; excepting water-rents.	No; excepting water-rents.		No; except water-rents.	No; except water-rents.	No; except water-rents.	No; except water-rents.	For water-rents only.	For water-rents.
13. Have you a printed tax levy ordinance showing details of rate of taxation?											
	Not for 1898.		Copy of ordinance enclosed.	Boston does not split up the tax rate for specific objects, but appropriates from her total income-taxes, plus estimated income, from other objects.		Yes.	Yes.	Yes.	Yes.	Yes.	Yes.
14. If you have any other information on this subject pertaining to your city, kindly send same.											

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VOL. V., No. 6.

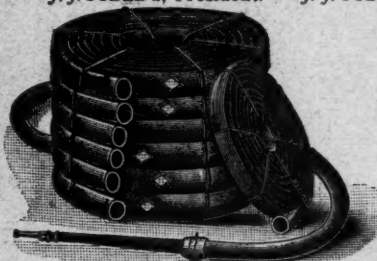
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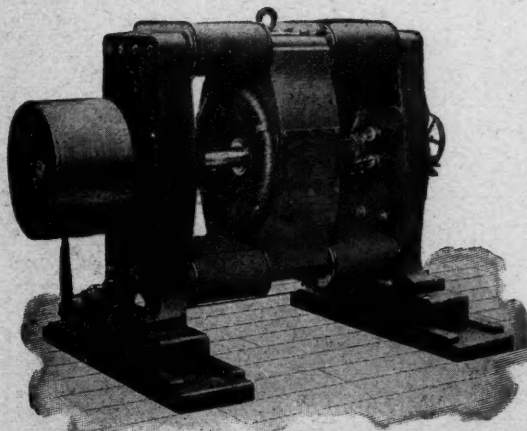


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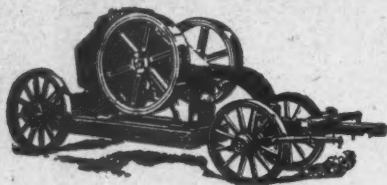
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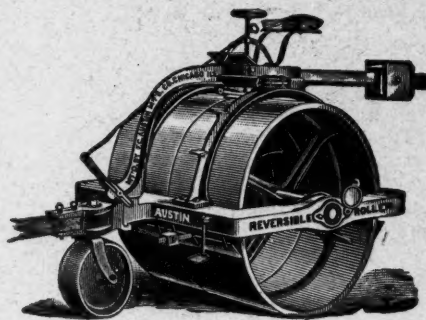
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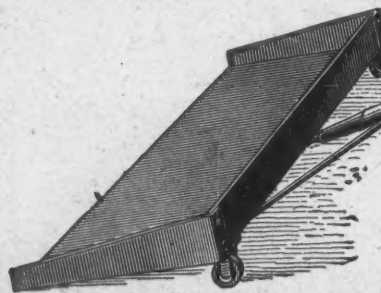
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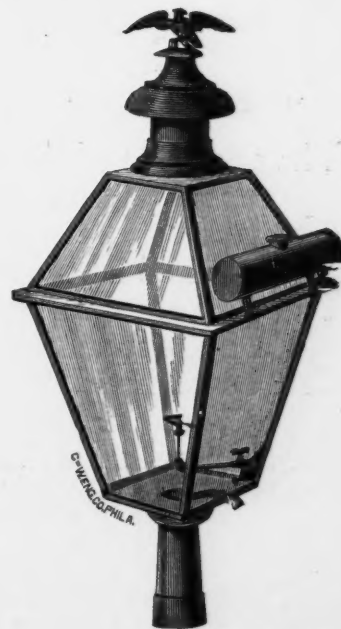
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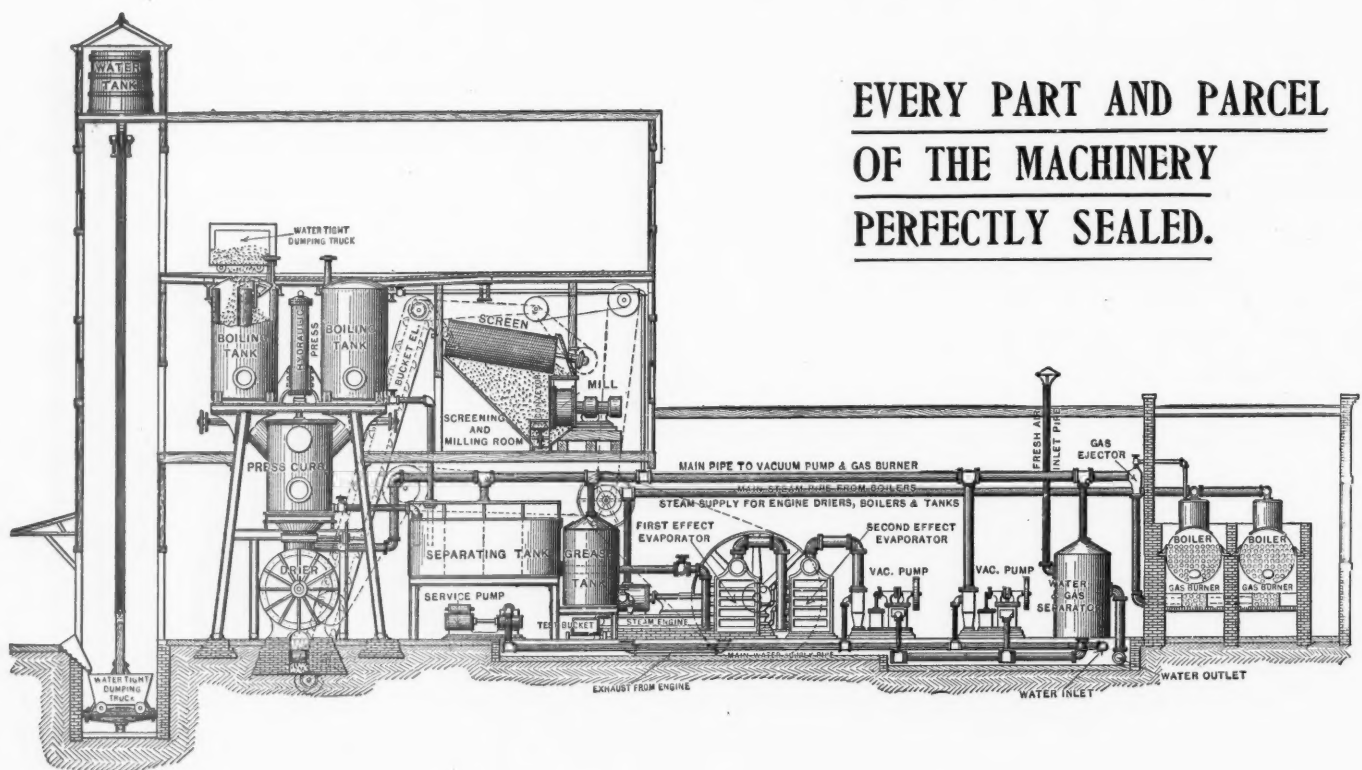
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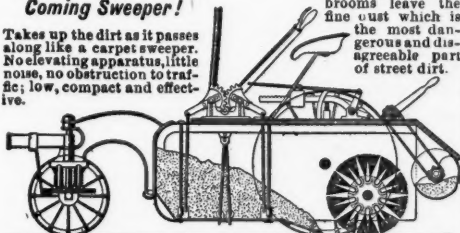
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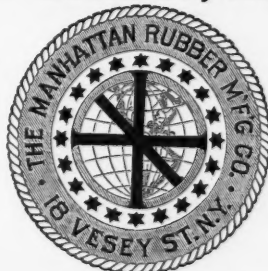


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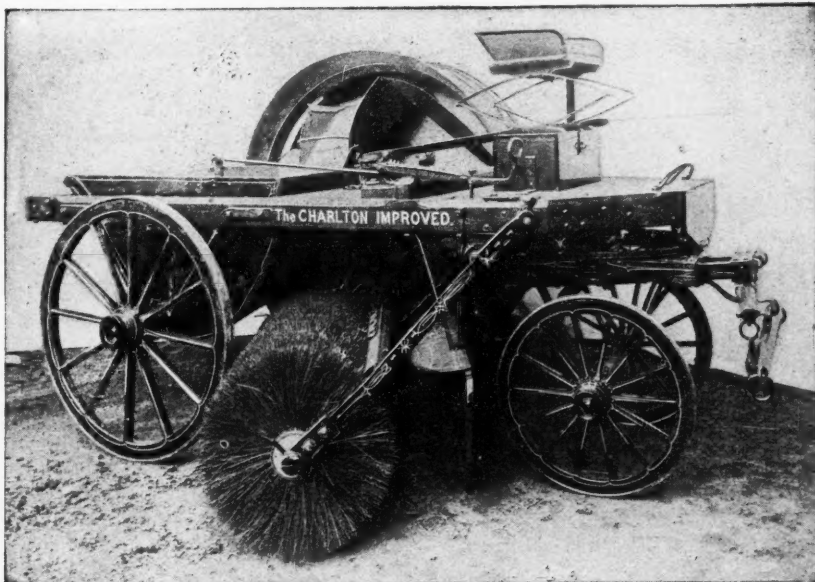
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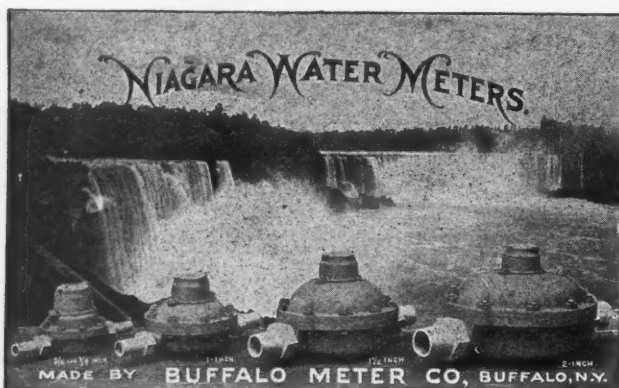
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—In an address to the recent Washington convention of the American Society of Municipal Improvements M. L. Holman, water commissioner of St. Louis, said: "The protection of the source of public water supply from contamination must be soon taken up in this country—not by any municipality as a local problem, nor by the state as a state problem, but by the general government as a general governmental problem. This branch forces itself upon the people of this country more strongly in the east than it does in the west. In the west we are only beginning to settle the country; the matter has not given us any bother as yet. In the east it has become a serious question."

—The factories of the American Fire Engine Company, located at Seneca Falls and Cincinnati, are crowded with work, and although the facilities of this company are unequaled by any other fire engine manufacturer in the world, the shops are obliged to run overtime to keep pace with orders. Three engines are under construction for New York, three for Chicago, two for St. Louis, two for San Francisco, two for Atlantic City, and one each for Buffalo, Macon and Colorado Springs; also a

stationary steam fire engine for the Alameda Sugar Company, of California. The rebuilding of old engines is a specialty of the American Fire Engine Company, and this department of the company's business has become an important feature. Fifteen engines are being repaired for the city of New York, two for the United States Government, two for Atlantic City, and one each for Columbia, Pa.; Hamburg, Pa.; Griffin, Ga.; Chariton, Ia., and Columbia, S. C.—Seneca Falls "Reveille."

—The "Scientific Australian," published at Melbourne and Sydney, in commenting upon a recent trial of fire-alarm apparatus at Melbourne, said: "The most interesting feature of the experiments, however, was a trial of the Montauk automatic fire-alarm cable, a newly patented American idea. The main instrument was disconnected from the recording apparatus and placed in circuit with the Bouverie Street Station. A flame was applied to the covered cable for a few seconds, and being thermostatic throughout its length, it was at once set in action and registered a pre-arranged call at Bouverie Street. As a result the hose-cart arrived at the head station in under three and a half minutes. This was convincing proof of the usefulness of this cable in conjunction with Mr. Kirby's instruments. Had this combination been in

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use in Elizabeth Street, Melbourne, in which the recent great fire originated, there is no doubt but that it could have been confined to small limits. The experiments were under the control of Chief Stein and his highly efficient staff of officers, and were an unqualified success."

—The official report of the St. Louis convention of the International Association of Fire Engineers says: "On the suggestion of Chief Bosch, superintendent of the fire-alarm telegraph system of Newark, N. J., the auxiliary fire-alarm system was shown to the members. After the exhibitor had demonstrated to the convention the benefits and advantages of the use of this auxiliary fire-alarm service, he explained that this auxiliary fire alarm was first introduced by the Gamewell Company. Then the

auxiliary company concluded that it would be better for all concerned if they took an interest in its management, and since that time have endeavored to perfect it and make it, as far as it is used, absolutely reliable. Recently they had combined with the original auxiliary telegraph, and used what is known as the Montauk multiphase automatic fire detective cable. The exhibit is placed before you to illustrate the combination of the auxiliary and the Montauk multiphase alarm cable, which is absolutely and solely a thermostat—the automatic transmitter telegraph for the interior of buildings doing away with or aiding night watchmen who have long rounds to make, or it may be connected from the outside with the fire-alarm system. The flame from an ordinary match will set it off anywhere."

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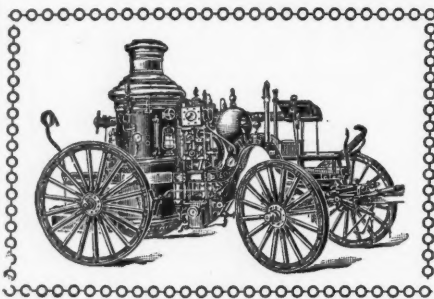
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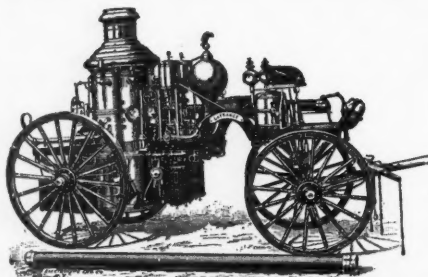
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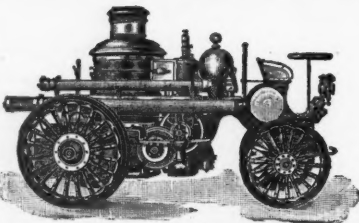
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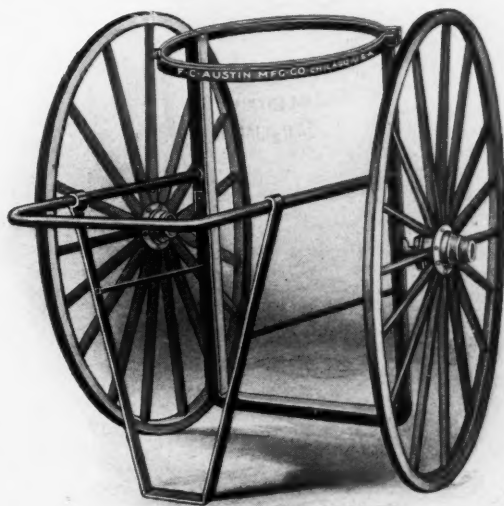


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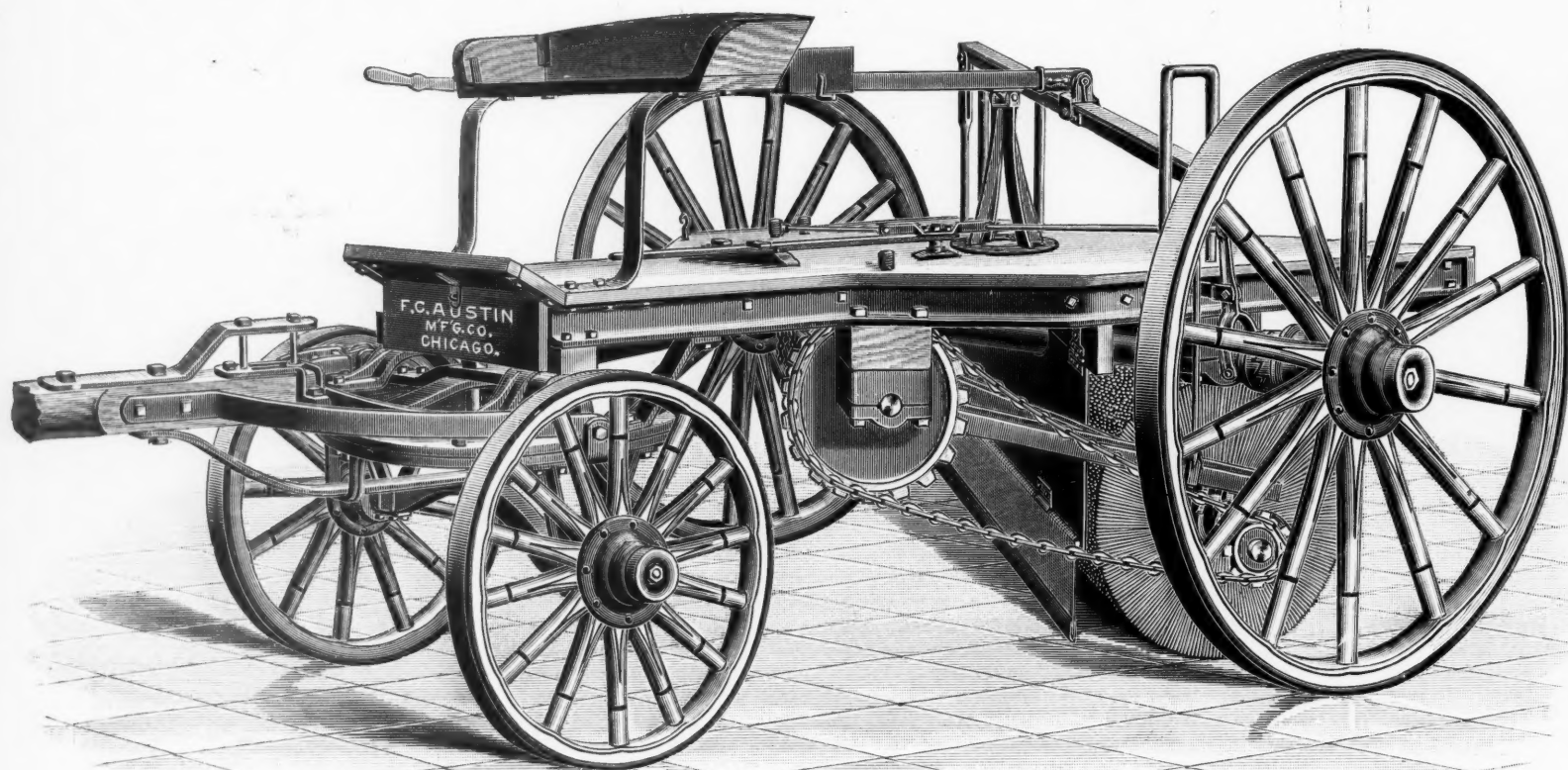
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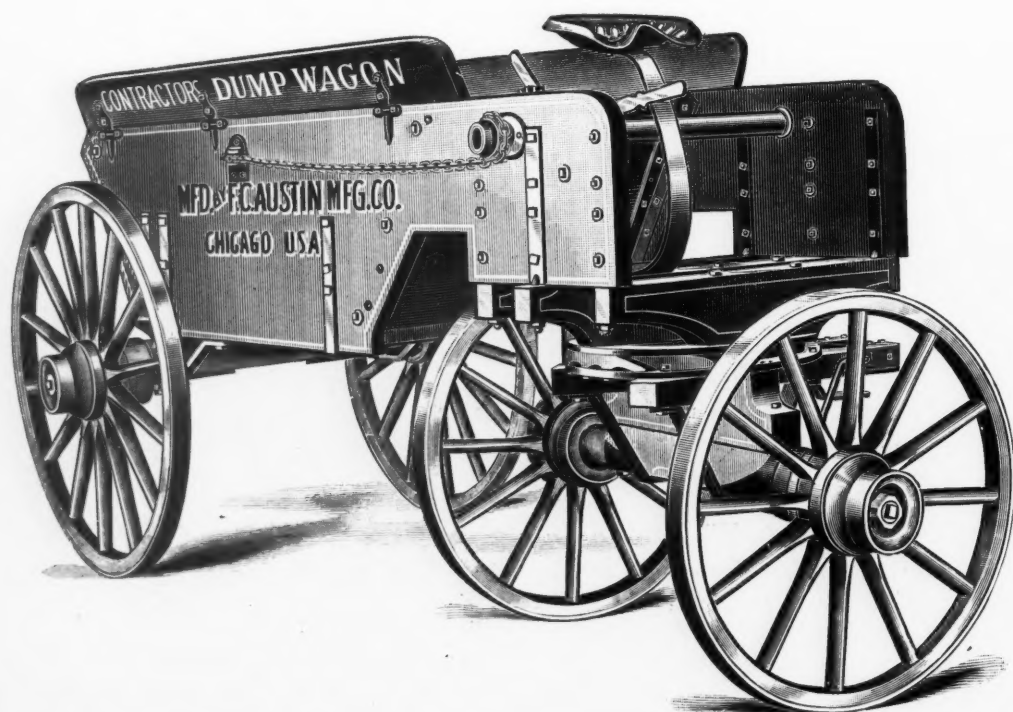


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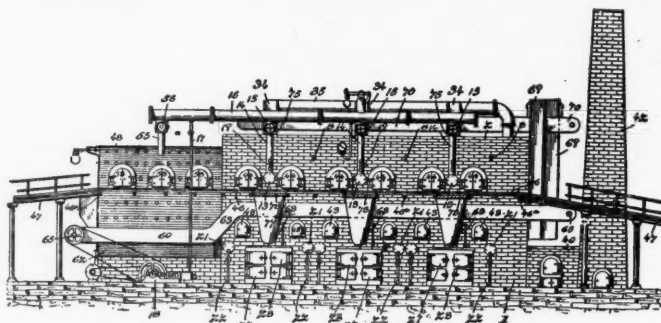


FIG. 1—SIDE VIEW EXTERNAL.

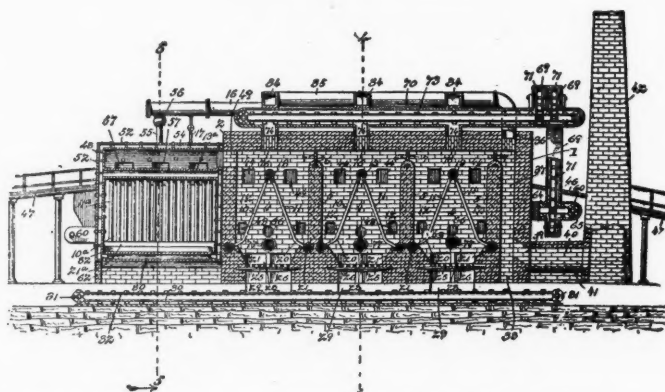


FIG. 2—LONGITUDINAL SECTIONAL VIEW OF ENTIRE CREMATORY.

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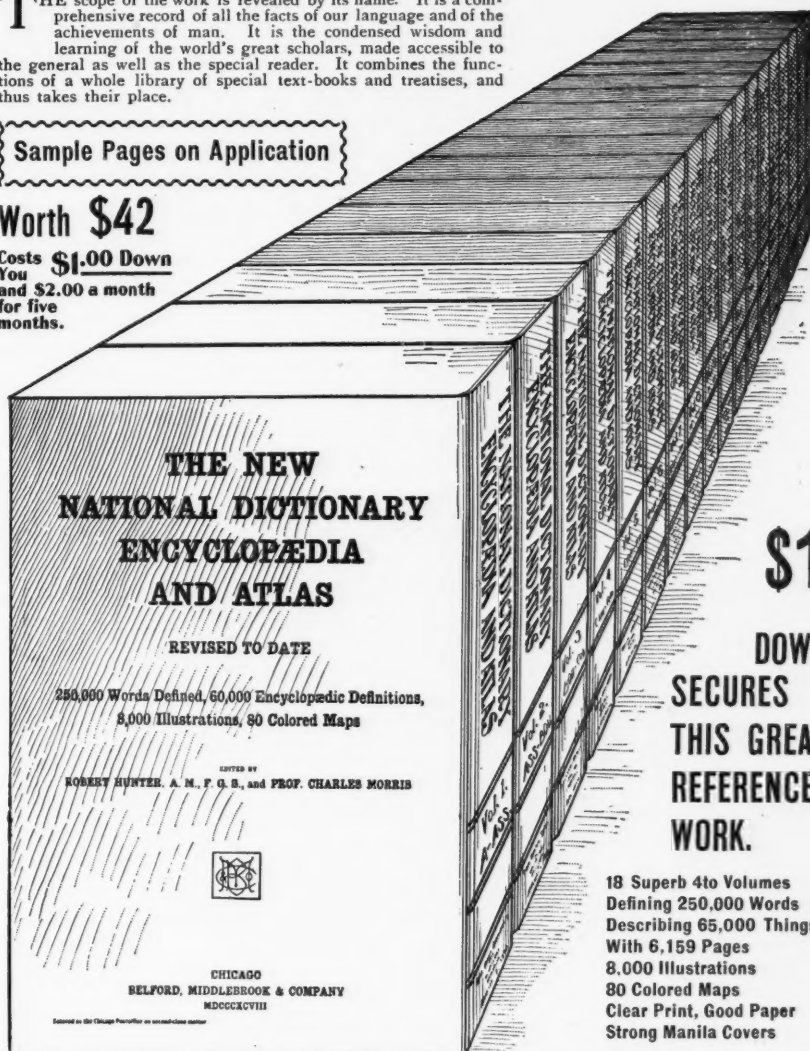
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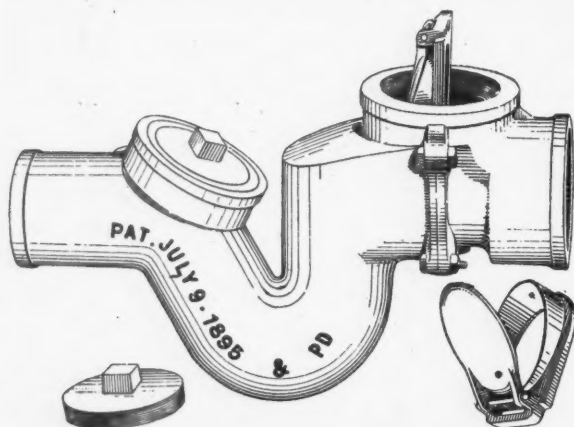


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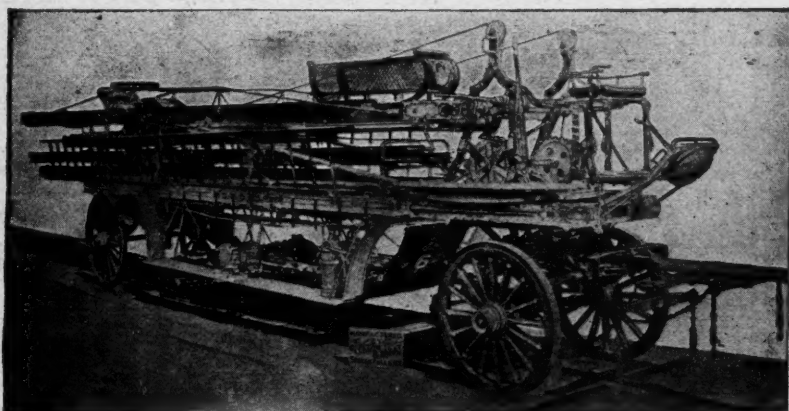
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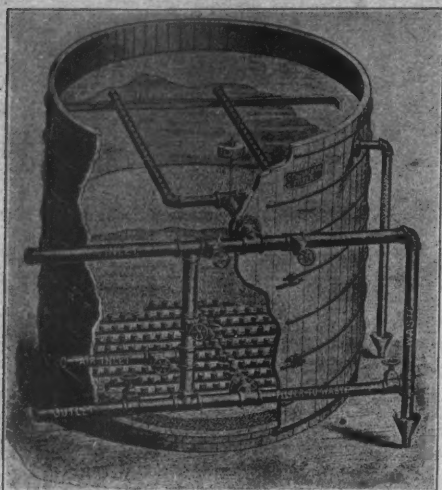
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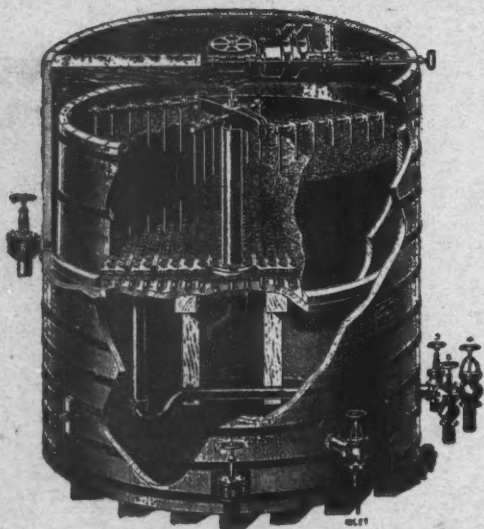
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